

A PROGRAM TO ENHANCE ORGANIZATIONAL PERFORMANCE AND CORE COMPETITIVENESS OF LIVION METAL INDUSTRY CO. LTD.

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Summary

In general, the longer a country engages in industrialization and the faster the pace of capital replacement and material accumulation, the more supply of scrap that is potentially available for recycling. On the other hand, developing countries with accelerating rates of industrialization and urbanization have much greater demand for both virgin non-ferrous metals and secondary non-ferrous metal scraps and a much smaller store of existing non-ferrous scrap stock.

Non-ferrous metal recycling, an important source of supply of many key raw materials for various industrial usages, has been recognized as a major contributor of many environmental benefits including significant energy savings and reduction of CO₂ emissions.

Based on the findings of this research, the NFM recycling industry will face increasingly strict operating regulations due to China's heavily polluted environment. With worsening condition of air and water quality throughout China, the NFM recycling factories with unqualified environmental-friendly facilities that fail to meet the environmental protection standards, set by Ministry of Environmental Protection, will be shut down. Additionally, both secondary copper and aluminum recycling and smelting factories will not only be required to meet strict new environmental standards, but will also need to increase their annual production capacity to at least 50,000 tons before the end of 2015. In other words, small nonferrous recycling and smelting factories will either be forced to expand to median size factories or shut down.

The target of the organizational consulting project was a nonferrous metal recycling and recovering company based in Ningbo, China, Livion Metal Industries Co., Ltd.. Founded in 1995, the company imports an average annual amount of 55,000 tons of secondary metal scraps and 32,000 tons of waste motors and electric generators, approximately 40% from Western Europe, 55% from North America, and 5% from others. The company provides sorted nonferrous metal scraps and medium quality zinc alloy ingots to downstream industries including 1) die casting for automobile parts (e.g. emergency brake), bathroom devices, stationary, electronic appliances, door locks, and decorations; 2) aluminum, copper (e.g. copper sticks), and stainless steel products manufacturers, in Zhejiang province, Jiangsu province, and Shanghai region.

The company created a performance evaluation system 12 years ago, hoping to acquire a full understanding of its performance periodically. The evaluation was performed at every end of a year. The company further granted its departments the authority to decide how they wished to measure the performance of their team members by what type of indicators. Nonetheless, the system was found providing some faulty conclusions regarding the company's performance. The consultant was retained to find out the cause of the problem and to propose a feasible solution to the problem.

To fulfill the original objective of the company to create a performance evaluation system, the implementation of the Balanced Scorecard (BSC), proposed by Kaplan and Norton in 1992 for businesses in a rapidly changing and highly competitive environment. BSC included four perspectives "financial", "customer", "internal", and "learning and growth", which have flexible relationships with one and another and all together contribute to give an important reference to improve a company's performance. BSC had been applied by many businesses around the globe and proven a powerful organizational performance evaluation system with the following qualities: BSC 1) could work as an internal communication platform for the organization's strategies; 2) could provide a clear organizational strategy guide; 3) could consolidate the direction of individual and the organizational efforts; 4) could further enhance the organizational internal efficiency and external core competitiveness.

In order to develop a simple version of Balanced Scorecard for Livion, a qualitative method was conducted by using two in-depth surveys and an analysis of the second hand

information given. Based on the findings, The three worst performances in the eight dimensions were Strategic Planning, Employee Satisfaction, and Human Resources. More specifically, Livion needs a strategic management system that helps to better response to the constant changes of the business environment as well as to better utilize the internal and external information collected at a regular basis. Second, the implementation of Balanced Scorecard can not only align the organization and individual's efforts toward the same goals, but also enhance individual expertise and growth, and help customers to better understand the value of Livion through its products and services. Third, such new management system can act as a double communication loop based on unified measures and strategic objectives. Encouraging feedbacks from staffs, both the CEO and department heads can be on the same page to review their quarterly performances while staffs can see how well they perform periodically. Last, the implementation of Balanced Scorecard can assist Livion to accomplish its short term goal by providing training programs to employees to enhance organizational efficiency and core competitiveness, mid-term goal by growing the market share in the current existing markets (i.e. Zhejiang province, Jiangsu province, and Shanghai region), and achieving a net annual profit of 10%, and long term goal by backward-integrating to Chinese waste automobile recycling business.

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CHAPTER1. INTRODUCTION

Section 1. PURPOSE AND OBJECTIVES OF THIS RESEARCH

The purpose of this research is to improve the organizational performance and core competence for Livion Metal Industry Company (LMI) by 1) investigating current performance evaluation system Livion has adopted; 2) understanding the vision, mindset, and core values of its business operation through two thorough surveys; 3) developing a simple version of Balanced Scorecard for Livion, in order to build a new management system. The objectives of this research set to illustrate:

- 1) A strategy map, based on Livion's mission, vision, and core values, and used as a business navigation tool, that contains four perspectives (i.e. financial, customer, internal process, and learning and growth) with measurements in each perspective.
- 2) A powerful organizational performance evaluation system with merits of Balanced Scorecard that help to unify the direction of individual and the organizational efforts as well as to work as an internal communication platform for the organization's long term success.

Section 2. RESEARCH SCOPE

This research focused primarily on a company providing products including nonferrous metal scraps, zinc alloy ingots, and dismantled waste motors and transmissions, and offered an analysis on the Chinese nonferrous metal industry that has greatly contributed to the success of the industrialization of China today.

Two in-depth surveys were conducted with senior managers and the president of Livion 1) to gain a good understanding of their opinion regarding current business operation as well as the future of the company; 2) and also to develop a simple version of Balanced Scorecard that can share the top

management's vision and strategy with the whole organization.

The research results and findings will offer insights into the strategies and the strengths of Livion, and the strategy map generated in this study should provide positive outcomes to the organizational internal efficiency and external core competitiveness of Livion.

Section 3. RESEARCH METHODOLOGY

The methodology employed in this research was a qualitative method that is exploratory in nature and based on the case study approach. An exploratory approach typically generates assumptions and conclusions that could be tested or used in further researches. There are many literatures state that qualitative interviews include forms of face-to-face group interviews, telephone interviews, and mailed questionnaires, which cover a wide range of topics of flexibility that can be conducted in any form as long as the interviewee and the interviewer are able to communicate in relative privacy without distractions (Fontana & Frey, 1998; Lindlof & Taylor, 2002). Such insightful information obtained through interviews is extremely useful for qualitative and exploratory studies.

Also noteworthy is that, there are various types of qualitative interviews which can be grouped into the following three types (Fontana & Frey, 2000): 1) structured interviews, 2) unstructured or semi-structured interviews, 3) group interviews. A structured interview often has fixed choice of answers that leave no room for improvisation, and the researcher using this method does not necessarily conduct the surveys in person to collect the data (Myers & Newman, 2007). Moreover, an unstructured or semi-structured interview, the most commonly used in qualitative research, allows improvisation that inspires more insightful and constructive responses. Last, group interviews can be either structured or unstructured interviews that involve two or more interviewees with one or more interviewers at a time. In this research, the second type of interview, more specifically the semi-structured interview, was used in the first survey, Livion's Business Philosophy, while structured interview was used in the second survey, Livion's Current Condition of Business Operation.

The in-depth interview, conducted in April 2013, was to identify management style taken by the participating company, and also to understand its business philosophy and current operation to develop a simple version of Balanced Scorecard. Given the purpose of the study and time constraints for implementation of Balanced Scorecard, a median size nonferrous recycling and zinc-smelting company would be suitable for the case study. At the outset, with full access to the information and employees necessary to complete this research, it was agreed upon both sides that the company name as well as of the employees, would be to remain anonymous. Financial and/or accounting information would also have to be kept in confidentiality.

Section 4. STRUCTURE OF THIS RESEARCH

The first chapter outlines the purpose, the objectives, the scope of this research, and the research methodology. The remainder of this thesis is organized as follows.

Chapter 2 provides the basic understanding of the term, Secondary nonferrous materials, analyzes the Chinese nonferrous metals recycling industry, and evaluates the impacts from the Chinese environmental protection policies, as well as the current operating conditions in the industry.

Chapter 3, Literature Review, began by studying the difference between the conventional and new performance evaluation system, followed by a comprehensive introduction of Balanced Scorecard, and an overview of the advantages and disadvantages of the implementation of Balanced Scorecard.

Chapter 4, Outline of Leading Metal Industry Co., provides both basic information and analysis on the company, investigates the factors that formed the background of the inefficiency in the current performance evaluation system, and discusses the process of developing a Balanced Scorecard.

Chapter 5, Research Results, began by presenting survey statistics and findings, and followed by interpretation of the results. The goal of this chapter was to gain some insights into the target company's business philosophy and current operation from both the top management and the

president, in order to develop reliable indicators in the Balanced Scorecard.

Chapter 6, conclusions, summarized this study by discussing the research results, the approach the company should take to implement the Balanced Scorecard, and the expectations of the implementation of Balanced Scorecard.

CHAPTER2. CHINESE NONFERROUS METAL RECYCLING INDUSTRY

Section 1. DEFINITIONS AND GLOSSARIES

The NFM industry covers a range of activities throughout the value chain, including mining, recycling, refining, and smelting. This study will not include mining and refining, and focuses on the recycling and smelting industry that play vital roles in the industrialization process of China. Non-ferrous Metals (NFM), defined as non-magnetic metals that lack iron, are mainly metal alloys made of aluminum, copper, zinc, tin, lead, nickel, gold, silver, platinum, palladium and etc. In general, they are more resistant to corrosion than ferrous metals, and are classified into three categories:

- **Basic metals:**

Aluminum, Copper, Lead, Nickel, Tin and Zinc

- **Rare metals:**

Beryllium, Bismuth, Cadmium, Cerium, Cobalt, Gallium, Germanium, Indium, Lithium, Mercury, Niobium, Selenium, Tantalum, Tellurium, Tungsten, Vanadium and Zirconium

- **Precious metals:**

Gold, Palladium, Platinum, Silver

Non-ferrous metal recycling, an important source of supply of many key non-ferrous metals for various industrial usages, has been growing in its significance in terms of energy savings and reduced emission of CO₂. It has contributed greatly to our earth by providing many environmental benefits. The sources of non-ferrous scraps are mainly from two streams, such as industrial stream and end-of-life product stream. Industrial stream includes new scrap, while end-of-life product stream includes old scrap. Each definition is as follows:

- **New scrap:**

Non-ferrous scrap that is mostly of high purity and value and is generated from different

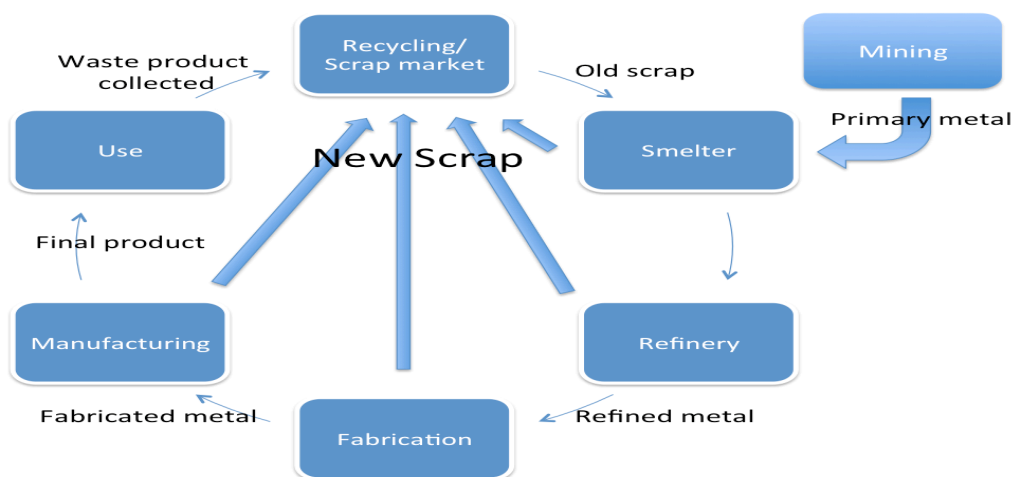
stages of manufacturing process that can be directly returned to the process that generated it, including fabrication or manufacturing process.. However, it becomes more difficult to return to the process, as it gets closer to finished product. For example, recyclers have to collect the precious metals from rejected printed circuit boards before they can be used again. Therefore, it is usually included in recycling statistics.

- **Old scrap (End-of-life scrap):**

Old scrap, also known as end-of-life (EOF) scrap, is metal in products that have reached their end-of-life. They are usually recycled from buildings, electronic components, home appliances, packaging, vehicles and industrial equipment. Old scrap requires more effort specially in the case of metal that is a small part of a complex product. It will be recovered, melted, and refined into primary forms (e.g. bar, billet, bloom, cake, ingot, slab, slug and wire) through smelting and refining processes, before further fabrication and manufacturing processes into final products.

The life cycle of scrap metal mainly includes six stages, recycling/scrap market, smelting, refining, fabrication, manufacturing, and consumer use, and can be described by the figure below:

Figure 2.1.1: Life Cycle of Scrap Metal



Source: UNEP (2011) Recycling Rates of Metals – A Status Report, A Report of the Working Group on the Global Metal Flows to the International Resource Panel. Graedel, T.E. et al., (pp.40)

1. **Aluminum Alloy:**

Aluminum is often used in alloy form with additions of copper, iron, silicon, manganese, magnesium, and other materials in order to improve flexibility and corrosion resistance. Within the aluminum recycling industry a distinction is made between refiners and remelters and between cast and wrought alloys. Refiners produce standard cast alloys from cast and wrought scrap and some primary material, while remelters produce wrought alloys almost only from wrought scrap. The difference between cast and wrought alloys is related to their composition.

- Cast alloys contain a maximum of 20% alloying elements (mainly Si, Mg, and Cu) and the silicon content is more than 5%.
- Wrought alloys contain a maximum of 10% alloying elements (Mn, Mg, Si, Cu, Zn) and less than 1% silicon. For this reason it is very difficult to make wrought alloys out of cast alloys, but it is possible to make cast alloys out of wrought alloys.

2. **Copper Alloy:**

Copper is often used in pure form as a conductor of electricity and heat, but has two major alloy families as well: copper-zinc alloys (brasses) and copper-tin alloys (bronzes). Small amounts of manganese, aluminum, and other elements may be added to bronzes and brasses to improve machinability, corrosion resistance, or other properties.

Founded in 1948, the Bureau of International Recycling (BIR) was the first federation to support the interests of the recycling industry in the world. It now represents more than 850 companies from private sector and 40 affiliated federations from 70 different countries. Its members are world leaders in the supply of raw materials and a key global facilitator for sustainable economic development. Its areas of recycling work include nonferrous metals, ferrous metals, paper, textiles, stainless steel, plastics, and tyres. According to the Bureau of International Recycling, the

nonferrous recycling processes involve the following steps:

- **Sorting**¹: In order to be recycled appropriately, different types of scraps are differentiated from each other, including nonferrous, paper, and plastic.
- **Baling**²: Nonferrous materials are compacted into large blocks to facilitate handling and transportation.
- **Shearing**³: Hydraulic machinery capable of exerting enormous pressure is used to cut metals into manageable sizes.
- **Media separation**⁴: Shredders incorporate rotating magnetic drums to separate nonferrous from ferrous metals. Further separation can be achieved using eddy current separator, which uses a powerful magnetic field to separate metals from nonmetals as they are carried through a conveyor belt, and thrown off the belt at different distances depending their weights and conductivity. Other separation methods include electrical currents, high-pressure air flow, liquid floating systems.
- **Melting**⁵: Nonferrous scraps are melted down in a furnace, poured into casters and shaped into ingots. These ingots are either used in the foundry industry or they can be transformed into flat sheets and other wrought products such as tubing, which are then used to manufacture new products.

Section 2. INDUSTRY OVERVIEW

In general, the longer a country engages in industrialization and the faster the pace of capital replacement and material accumulation, the more supply of scrap that is potentially available for recycling. In theory, metals can be used repeatedly, minimizing the need to mine and produce primary materials and thus saving significant amounts of energy, water and fresh air, while reducing

¹ <http://www.bir.org/industry/non-ferrous-metals/>

² Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

³ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁴ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁵ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

environmental degradation in the process. Developing countries with accelerating rates of industrialization and urbanization have much greater demand for both virgin non-ferrous metals and secondary non-ferrous metal scraps and a much smaller store of existing non-ferrous scrap stock.

Industrialized countries value recovered resources as one of the critical part of the growth of their economies. In recent decade, world recovered copper production accounts for 40 – 55%⁶ of the world virgin copper production, which 60%⁷ for US, 45%⁸ for Japan, and 80%⁹ for Germany. world recovered aluminum production accounts for 35 – 50%¹⁰ of the world virgin copper production, which 50%¹¹ for US, 90%¹² for Japan, and 45%¹³ for Germany. As the level of recycling mechanization is low, and most of the recycling activities are conducted by intensive use of labor, the operating cost is relatively cheaper both in China and India. Therefore, an enormous amount of secondary materials flows into both China and India, as they have competitive advantage of lower manufacturing costs over others in the world.

Recovered copper include two types: 1) new scraps that generate from the production processes, where the yield rate of effective products is only 60 – 70%¹⁴; 2) old scraps either recycled domestically or imported from overseas. Currently, there are more than 3000¹⁵ copper recycling enterprises, mainly privately owned SMEs, in China. Their business operation includes waste copper collecting, dismantling, categorizing, melting, processing, and selling.

Chinese aluminum recycling industry started in the late 70s, relatively late compared to the industrialized countries. Due strong aluminum demand, the number of companies in this industry increased significantly in the 80s, and as foreign recyclers gradually entered Chinese market in the

⁶ <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

⁷ Ibid, <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

⁸ Ibid, <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

⁹ Ibid, <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

¹⁰ Ibid, <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

¹¹ Ibid, <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

¹² Ibid, <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

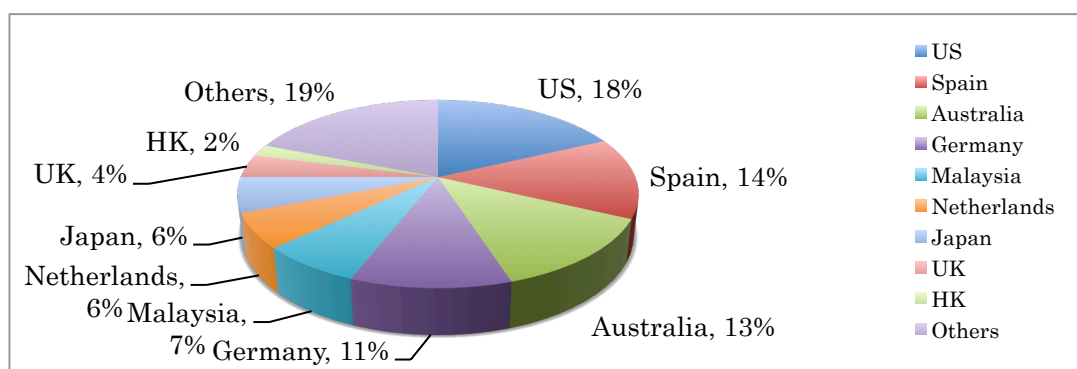
¹³ Ibid, <http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233.html>

¹⁴ http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233_2.html

¹⁵ http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233_2.html

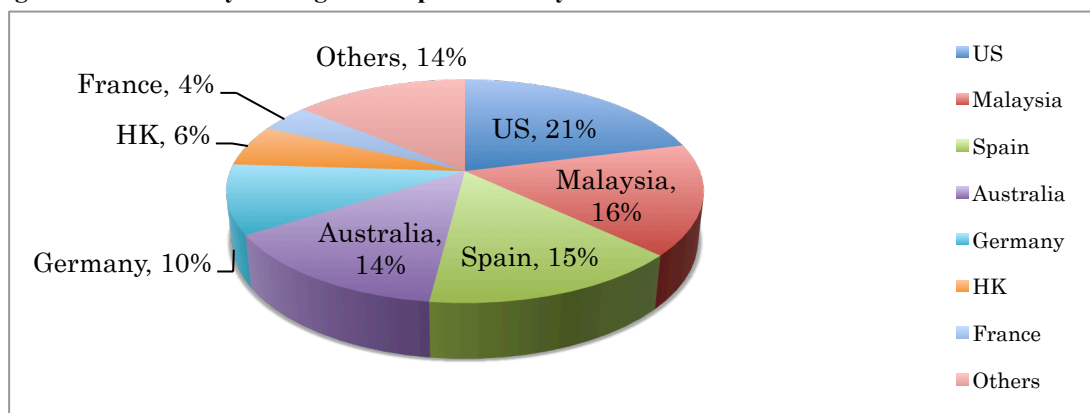
90s, all combined makes up more than 2000¹⁶ aluminum recycling enterprises in China today. Recovered aluminum includes two types: 1) new scraps that generate from the production processes, where the yield rate of effective products is only 70%¹⁷; 2) old scraps either recycled domestically or imported from overseas.

Figure 2.2.1: Country of Origin of Imports of Recycled Copper into China in 2010



Source: The Yearbook of Nonferrous Metals Industry of China 2011

Figure 1.2.2: Country of Origin of Imports of Recycled Aluminum into China in 2010

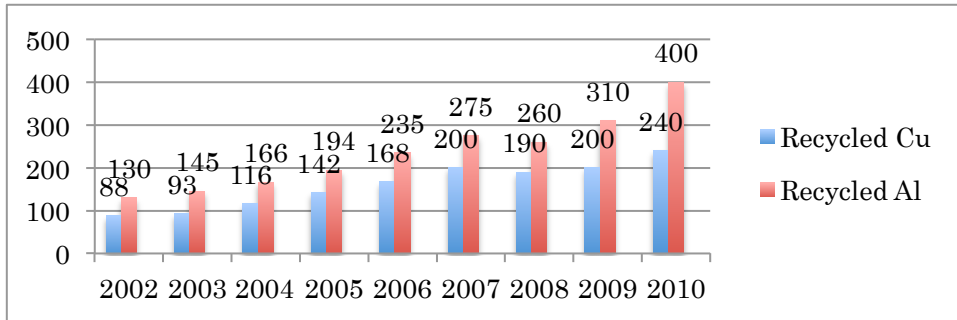


Source: The Yearbook of Nonferrous Metals Industry of China 2011

¹⁶ http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233_4.html

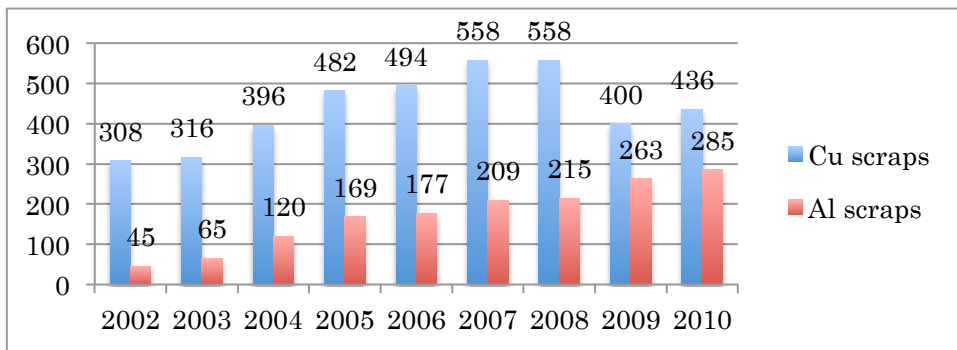
¹⁷ http://www.cmra.cn/a/guonawaixingyedongtai/20090806/1233_3.html

**Figure 2.2.2: Annual Productions of Recycled Copper & Aluminum 2002-10
(Unit in million tons)**



Source: The Yearbook of Nonferrous Metals Industry of China 2011

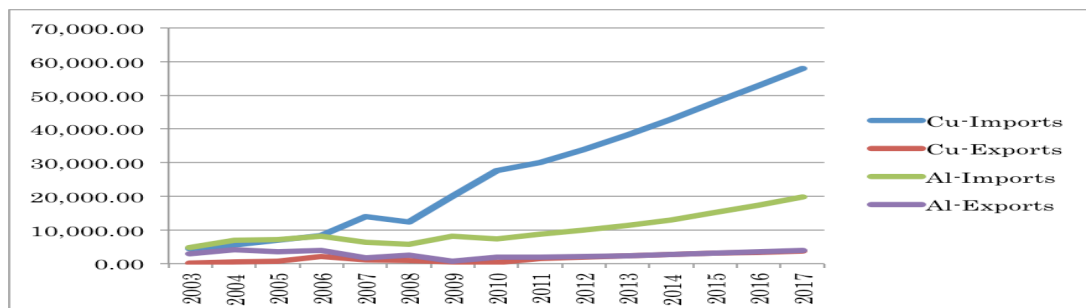
**Figure 2.2.3: Annual Import of Recycled Copper & Aluminum 2002-10
(Unit in million tons)**



Source: The Yearbook of Nonferrous Metals Industry of China 2011

According to IBIS World report regarding Chinese copper smelting industry described in Figure 2.2.5, the amount of all types of copper imports has increased more than six times larger from 2003 to 2012, while its exports remain fairly low. On the other hand, the amount of all types of aluminum imports has increased about four times larger from 2003 to 2012, while its exports remain at about the same level throughout the years. It is noteworthy that, the copper imports will continue to grow at a fast pace throughout 2017, due to various strong demands from many pillar industries in China, in particular the construction industry.

Figure 2.2.5: Patterns of Imports and Exports of Copper and Aluminum



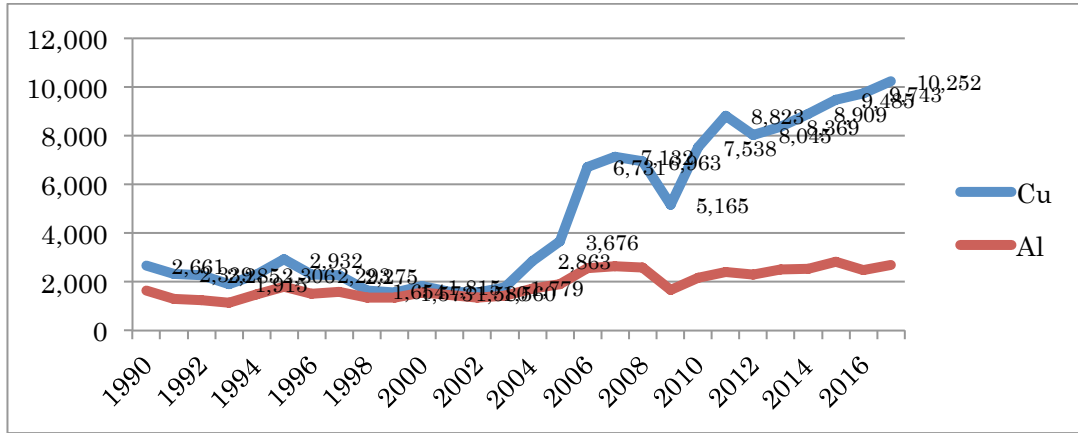
Source: IBISWorld; Copper Smelting in China; Aluminum Smelting in China

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To estimate the price of a stock of secondary metal scraps offered by the foreign markets, the nonferrous recyclers look at each metal's relative percentage in such stock, and calculate an estimation by using the metals' spot prices and future prices (i.e. 1 month, 3 month, 6 month, etc.) listed on the London Metal Exchange (LME), the world's largest metal exchange market that has great influence over the sales, production, and inventory of nonferrous metals. On the other hand, nonferrous recyclers also consider the metals' spot prices and future prices (i.e. 1 month, 3 month, 6 month, etc.) listed on the Shanghai Futures Exchange (SHFE), when they handle and sell them in China. In Figure 2.2.6, the price of copper increased from US\$1,573 in 1999 to US\$8,045 in 2012, 511% increase. It is forecast to continue the upward trend to reach US\$10,252 by 2017, due to strong demands from emerging countries, in particular China, which now accounts for 42%¹⁸ of global metal consumption.

¹⁸ Ling Tong Metal Information Co. Ltd., <http://www.lingtonginfo.com/en2010/en/eindex.asp>

Figure 2.2.6: Patterns of World Copper and Aluminum Prices from 1990-2017



Source: IBISWorld; World price of aluminum; World price of copper

Zinc is an important basic material and widely used in many fields, such as automobile industry, building and construction, stationary and office supplies manufacturing, bathroom devices manufacturing. In particular, its main use is in coating steel, such as galvanization in the automobile industry. The demand for zinc increased rapidly in China in recent years with the booming economic growth (Figure 2.3.4 Output and Consumption of Slab Zinc in China). As a result, China has become the largest country in zinc consumption today.

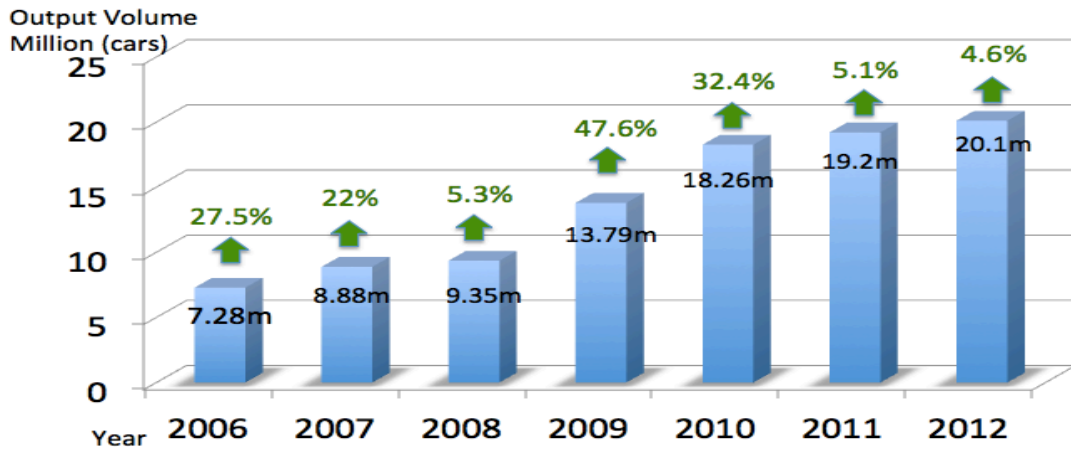
Figure 2.2.7: Output and Consumption of Slab Zinc in China (Unit: 10kt)

Year	2008	2009	2010
Production	404.23	428.63	520.89
Consumption	414.52	435.00	485.00

Source: The Yearbook of Nonferrous Metals Industry of China 2011

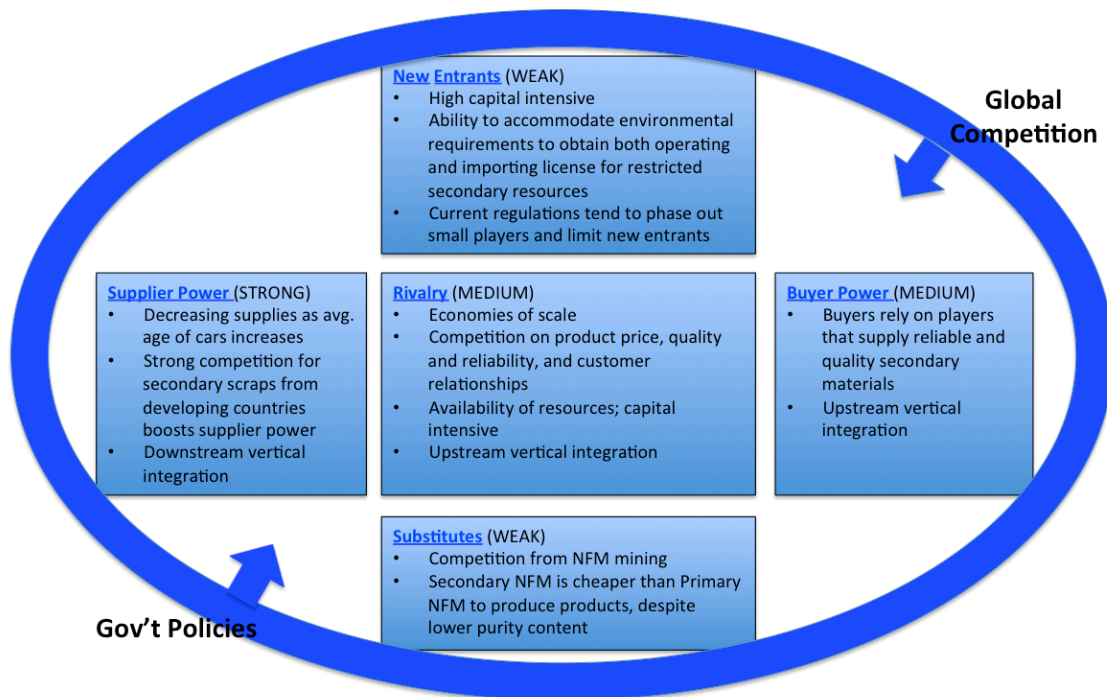
The reserves of nonferrous metal scraps can be found in the automobiles sold in China. The output of cars increased from 7.28 million units in 2006 to 20.1 million units in 2012, an increase of 176% (Figure 2.2.8 Annual Automobile Output Volume in China). This indicates that the automobile industry is in an upward trend, and will continue to generate many reserves of nonferrous metal scraps in the future. For the NFM recyclers in China, this implies a huge opportunity to source domestically, rather than depend heavily on the foreign imports.

Figure 2.2.8: Annual Automobile Output Volume in China



Source: IBIS World Report-Automotive Manufacturing in China

Figure 2.2.9: Porter’s Five Forces Analysis of Chinese NFM Recycling Industry



Based on the requirements, set by Ministry of Environmental Protection (MEP), to obtain both a license to operate a nonferrous recycling and refining factory and an import license to import nonferrous metal scraps from abroad, the size of a factory is defined as follows: 10 acre of land receives 10,000 tons of import quotas of secondary NFM, along with maximum labours of 60 people.

In Figure 2.2.10, there are four factors that illustrate the size of a factory, small, median, and large:

1) **Small size factory:**

The number of employees is from 1 to 180 people; the annual refined nonferrous metal production capacity is from 1,000 to 30,000 tons; the size of land is from 1 to 29 acres; all the small size factories do not have facilities that meet the environmental protection standards set by MEP in part due to the lack of capitals. Furthermore, MEP requires factories of all size to install both a zero-water-discharge system that circulates and reuses the water within the factory, and an air purifier system that collects dusts and emits air from the workshops that meets the Ambient Air Quality Standard.

2) **Medium size factory:**

The number of employees is from 181 to 999 people; the annual refined nonferrous metal production capacity is from 30,000 to 166,000 tons; the size of land is from 30 to 166 acres; **most of** the medium size factories have facilities that meet environmental protection standards set by MEP.

3) **Large size factory:**

The number of employees is at least 1,000 people; the annual refined nonferrous metal production capacity is from 30,000 to 166,000 tons; the size of land is from 30 to 166 acres; all the large size factories have facilities that meet environmental protection standards set by MEP, because they have abundant capital for investments for advanced facilities and technologies.

Figure 2.2.10: Definition of the Size of a Chinese NFM Recycling Factory

Factors	No. of Employees			Annual Production Volume (unit in thousand tons)			Size of Land Area (unit in are)			Facilities that meet MEP standards
	1~180	181~999	1000~	1~30	30~166	167~	1~29	30~166	167~	
Size										
Small	✓			✓			✓			
Median		✓			✓			✓		✓
Large			✓			✓			✓	✓

In 2012, the five key issues in NFM industry in China are 1) Overcapacity in metal processing, for example, the production of electrolytic aluminum production is excessive that the utilization rate is only 72%¹⁹ of the total production of 2765²⁰ million tons. The products in downstream sectors are too identical, and so the firms tend to reduce cost by producing more, and thus overcapacity and price competition continue to harm the industry and could eventually lead to trade disputes on a global scale; 2) Firms depend heavily on imports of many NFM scraps, in part due to insufficient mines in China and the lack of shredding machineries for recycling automobiles. 3) Firms that are vulnerable to rising energy costs (e.g. electricity and gas) and production costs have ceased production, in particular, the firms in mid-eastern part of China where the cost of electricity is high. On average, the operational cost, sales cost and management cost increased by 16.7%²¹, 11%²² and 12%²³, respectively, while the financial expenses increased by 27.8%²⁴; 4) Gloomy demand from downstream markets due to European solvency crisis and dwindling growth from emerging

¹⁹: China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.
²⁰ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.
²¹ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.
²² Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.
²³ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.
²⁴ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.

markets, and intensified conflicts of international trades, among US, Canada, Europe, India and Argentina, have initiated anti-dumping duty against China on products including copper pipes, aluminum molding, aluminum foil, aluminum wheels and magnesium; 5) Weak R&D that lacks ability to make high end products, given the middle and low end production where China NFM industry positions itself in the global industrial division of labor chain. For instance, further processed copper and aluminum products have average exporting prices of US\$8,570²⁵/ton and US\$3,470²⁶/ton, respectively, while the average importing prices are \$US10,100²⁷/ton and \$US6,380²⁸/ton, respectively. Therefore, China will need innovation capability for making high-end products.

That being said, the main tasks China NFM Industry Association plans to carry out are 1) strengthening the entrance requirements of copper, aluminum, zinc, lead, and precious metals (e.g. sponge titanium and zircon smelting) production; 2) actively eliminating the obsolete electrolytic aluminum production by closing down firms that do not meet environment-friendly standards set by MEP, and by raising electricity costs on such firms; 3) encouraging firms to adopt new techniques and to invest in R&D, in order to supply high-grade aluminum products to aerospace, transportation, construction and other strategic emerging industries; 4) giving incentives (e.g. fund subsidies) to finance healthy firms to build foreign resource bases, in order to secure resources and to reduce excessive capacity in domestic production; 5) investigating current operational conditions of key NFM firms in key provinces and regions, in order to enact policies and guidelines in the 12th FYP for NFM industry; 6) actively enacting laws regarding the development of precious metals industry.

²⁵ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.

²⁶ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.

²⁷ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.

²⁸ Ibid, China Nonferrous Metals Industry Association.
<http://www.chinania.org.cn/html/hangyetongji/tongji/2013/0218/11258.html>.

Figure 2.2.11: Policies Related to China’s Non-ferrous Metal Industry

Date issued	Policy Description
1989 Mar.	Establishment of Basel Convention
1991 Mar.	MEP announced “Strict Regulation of Trans-boundary Movement on Hazardous Waste Import to China”
1991 Sep.	Standing Committee of the National People’s Congress ratified Basel Convention
1994 Nov.	MEP announced “Temporary Provisions on strict regulations to import waste from the European Community (EC)” (Ban of red and yellow –color listed waste imports)
1995 Oct.	MEP promulgated Law on Prevention and Control of Environmental Pollution by Solid Waste (amended 2004)
1995 Nov.	State Council promulgated “Emergency Notification on Controlling the Movement of Import Waste within China”
1996 Mar.	“Temporary Provisions on the management of waste import environmental protection” (MEP, Ministry of Commerce, Customs, State Administration of Industry and Commerce, Commodity Inspection Bureau)
1996 Jul.	“Supplementary of Temporary Provisions on Environmental Protection Management of Waste Import” (same as above)
1996 Jul.	"Interpretation of the Supreme Court on the issue of applicable law in some criminal trials of illegal waste imports"
1996 Sep.	Management Rules regarding Pre-shipment Inspection of Import Waste (Commodity Inspection Bureau)
1996 Oct.	Addition of Class 10 (plastic waste) and Class 5 regarding import wastes that can be used as a raw material (MEP, Ministry of Commerce, Customs, State Administration of Industry and Commerce, Commodity Inspection Bureau)
1997 Feb.	State Council promulgated “Emergency Notification on Prohibiting the Import of Radioactive Waste Metal Scrap”
1999 Nov.	Management Rules regarding Pre-shipment Inspection of Waste Import of Raw Materials (AQSIQ)
2000 Jan.	Further Strengthening the Management of Waste Import (SEPA)
2000 Feb.	Notification of Ban on Import of Class 7 and Other Electronic Waste (MEP, Ministry of Commerce, Customs)
2001 May	Notification of Adjustment on Management of Environmental Protection Regarding Waste Import (MEP, Customs, AQSIQ)
2001 Nov.	Notification of Adjustment on Procedure of Examination for Enterprises that Engage in Class 7 Waste (MEP)
2001 Dec.	Automatic Import License of Freights, Effective from Jan 1 st 2002
2002 Mar.	Notification of Authorization on Restricted Waste Import of Waste Plastics and Waste Vehicles. Automatic Registration Management for Paper, Steel Scrap, Copper Scrap and Aluminum Scrap (excluding non-ferrous waste electronics, waste wire cables and waste motor)
2002 Jul.	Enforcement of Ban on Parts Import (MEP, Ministry of Commerce, Customs)
2002 Dec.	Amendment on Definition of Penalties on Conducting Smuggling or Waste Import (Solid, Liquid, Gas) (Congress) Enforcement of Quarantine, Supervision and Management on Imports of Used Electromechanical Products (AQSIQ)
2003 Apr.	Notification of Environmental Protection Management of Restricted Imports of Waste Raw Materials
2003 Aug.	Provisions on Examination Procedures of Imports of Used Electrical Equipment Products (AQSIQ)

2004 May	Enforcement of Registration of Foreign Suppliers of Waste Raw Materials (AQSIQ)
2006 Jun.	Copper Smelting Industry Access Conditions
2007 Mar.	Lead and Zinc Industry Access Conditions
2007 Oct.	Aluminum Industry Access Conditions
2010 Apr.	MIIT released Special Plan on Comprehensive Utilization of Metal Tailings (2010-15)
2010 Jul.	On Jul 15 th 2010, Customs cancelled export tax rebate of some non-ferrous metal processing materials
2010 Aug.	On Aug 5 th 2010, MIIT announced a list of companies from 18 industries, including copper smelting, to be eliminated for backward production capacity
2010 Aug.	MIIT issued the Interim Measures for the Access Administration of the Copper Smelting Enterprises
2010 Nov.	Ministry of Land and Resources released the Directory to Encourage, Restrict and Obsolete technology in Conservation and Comprehensive Utilization of Mineral Resources
2010 Dec.	MIIT released Directory to eliminate Backward Production Technology Equipment and Products (2010version)
2011 Feb.	MIIT, Ministry of Science and Technology and Ministry of Finance jointly issued Development Plan to promote the Regeneration of Non-ferrous Metal Industry
2011 Mar.	MIIT unveiled Magnesium Industry Access Conditions
2011 Apr.	On April 1 st 2011, Rare earth resources tax was raised
2011 Apr.	National Development and Reform Commission and MIIT to curb overcapacity and redundant construction of the electrolytic aluminum industry
2011 May.	State Council: Strictly control the export of primary products of rare earth
2011 Nov.	Ministry of Land and Resources paused approval on mining rights of six minerals
2011 Nov.	18 bases nonferrous metals in NFM Industry were selected as the 1 st demonstration base of comprehensive utilization of mineral resources
2011 Nov.	Comprehensive utilization of ferrous metal series was implemented by 50% VAT rebate on the spot.
2011 Dec.	Ministry of Land and Resources issued a formal 12 th FYP on conservation and comprehensive utilization of mineral resources

Source: China Nonferrous Metals Industry Association

Section 3. ENVIRONMENTAL POLICIES

This chapter presents the most important environmental regulations applicable to the NFM recycling industry. As environmental protection becomes a critical issue in recent years, NFM recyclers have to comply with many environmental regulations, which are the standards MEP reflects on environmental permit applications and inspection visits. The administrative costs and effort, and the investments on environmental protection facilities are also major factors to gain access into NFM recycling industry.

China's Five-Year Plans (FYPs) is the guideline for the nation's public policy priorities

regarding its economic and social development, and it has a significant impact on direction of the development of nonferrous metal recycling industry in China as well as the global metal exchange markets. In the 11th FYP, one of the main concepts, known as the “circular economy”(OECD Environmental Performance Reviews: China, pp. 130), is the economic expansion by more efficient use of resources, rather than increasing use of resources, aiming to create a “resource-saving and environmentally-friendly society”. The term circular economy represents an alternative economic growth model that is based on better management of natural resources, energy efficiency and pollution prevention and control. In other words, it does not depend intensive use of energy and other primary resources in exchange of wastes and pollutions.

The environmental targets set in the 11th FYP include (OECD Environmental Performance Reviews: China, pp. 199):

- Energy intensity to be reduced by 20%
- Water consumption per unit of industrial value-added to be reduced by 30%
- Water for irrigation in agriculture maintained at current levels
- Recycling of industrial solid waste to be increased by 60%
- Area of farmland to be retained at 120 million hectares
- Total discharge of major pollutants reduced by 10%
- Forest coverage to reach 20%
- Control of greenhouse gases to “generate good results”

Thanks to the concept of circular economy, NFM recycling industry has become a significant part of NFM industry in recent years in China. In February 2011, Ministry of Industry, Ministry of Science and Technology and Ministry of Finance jointly published the Promotion Plan on Development of Recycling Non-ferrous Metal Industry. It further defined related regulations that will fully play the roles of finance, taxation, environmental protection, land and other policy means in promoting the development of non-ferrous metal recycling industry. In addition, it identifies major goals to be achieved by 2015: 1) increasing the proportions of scale and output of non-ferrous

recycling industry; 2) encouraging firms to use enhanced technical equipment during preprocessing, dismantling and melting process in order to save energy and protect environment.

Since 2011, China has established policies to promote energy conservation, technological innovation, mergers and reorganizations by accelerating the transformation of development in the non-ferrous metal industry. The focus of such policies is to strictly control the rapid expansion of smelting capacity and to actively monitor its impact on the environment. Comparing the energy savings and carbon emission results of 2010 and 2005, nonferrous metal industry had achieved reduction of 14²⁹ million tons of coal, equivalent to 38³⁰ million tons of reduction of CO₂ emission, and achieved energy savings by 14.1%³¹, exceeded the target 10%³² benchmark set by the Energy Conservation Program of Nonferrous Metal Industry in 2007.

The outline of the 12th FYP for national economic and social development underlines the importance of climate change and consolidates measures for China's mid-term and long-term plans for economic and social development. First, it sets concrete targets to reduce energy consumption per unit of GDP by 16³³ percent, to cut CO₂ emissions per unit of GDP by 17³⁴ percent, and to increase the proportion of non-fossil fuels in the total primary energy mix to 11.4³⁵ percent. Such objectives and policy orientation will determine how effective China can response to the climate change over the next five years, and identify key tasks, including curbing greenhouse gas emissions, adapting to climate change, and deepening international cooperation. Furthermore, China has committed to make non-fossil energy to account for 15% of its total primary energy consumption, and to make CO₂ emission per unit of GDP 40 to 45% lower than that in 2005.

²⁹ The Yearbook of Nonferrous Metals Industry of China 2011, pp. 82

³⁰ Ibid, The Yearbook of Nonferrous Metals Industry of China 2011, pp. 82

³¹ Ibid, The Yearbook of Nonferrous Metals Industry of China 2011, pp. 82

³² Ibid, The Yearbook of Nonferrous Metals Industry of China 2011, pp. 82

³³ The National Development and Reform Commission The People's Republic of China, (2012). China's Policies and Actions for Addressing Climate Change, pp. 2

³⁴ Ibid, The National Development and Reform Commission The People's Republic of China, (2012). China's Policies and Actions for Addressing Climate Change, pp. 2

³⁵ Ibid, The National Development and Reform Commission The People's Republic of China, (2012). China's Policies and Actions for Addressing Climate Change, pp. 2

In 2002, China first established nonferrous metals recycling industry entry standards for four basic metals: copper, aluminum, lead and zinc. In 2009, MIIT has enacted the “Special Plan for Secondary Nonferrous Metals Utilization 2009-2015”. It is the first official non-ferrous metals industry plan in China, and states that the output of major secondary non-ferrous metals is forecasted to reach 11.1³⁶ million tons by 2015, among which 3.8³⁷ million tons are secondary copper, 5.8³⁸ million tons are secondary aluminum. The output of secondary refined copper will contain 40%³⁹ of the total output of refined copper, and the output of secondary aluminum will contain 30%⁴⁰ of the total output of electrolytic aluminum.

The plan specified the required entry condition that includes the size of a firm, new construction and reconstruction, and smaller scales such as workshop production will be eliminated. Second, the plan states more stringent requirements on energy saving and emission control, and projects exceed the level limits of energy consumption and pollution will be phased out. Third, the plan provides enterprises with various supports when they innovate their furnaces that meet national standards. Finally, it strictly requires that secondary metals be burnt in environmentally friendly furnaces that collect the dusts generated and recycled the water used during the process, and solid waste be treated collectively, in order to minimize the emission of sulfur dioxide. The plan specified the industry entry conditions with an emphasis on environmental protection than any other previous ones, which indicates a signal of strengthening environmental protection regulation in the next 10 years.

There are three grades of quality function areas in the environmental standards: 1) Grade I is nature reserves, scenic spots and other areas in need of special protection; 2) Grade II is residential

³⁶ China Nonferrous Metals Industry Association Recycling Metal Branch,
<http://www.cmra.cn/en/?p=657>

³⁷ Ibid, China Nonferrous Metals Industry Association Recycling Metal Branch,
<http://www.cmra.cn/en/?p=657>

³⁸ Ibid, China Nonferrous Metals Industry Association Recycling Metal Branch,
<http://www.cmra.cn/en/?p=657>

³⁹ Ibid, China Nonferrous Metals Industry Association Recycling Metal Branch,
<http://www.cmra.cn/en/?p=657>

⁴⁰ Ibid, China Nonferrous Metals Industry Association Recycling Metal Branch,
<http://www.cmra.cn/en/?p=657>

areas; commercial, transportation and residential mixed areas, cultural areas and general industrial areas specified in urban planning as well as rural areas; 3) Grade III is specific industrial zones; 4) A grade above Grade III is considered harmful to human health.

Ambient air quality standard⁴¹ (GB3095-1996, effective Oct 1st 1996):

It aims to protect the environment, and to minimize the harmful effects on human health by monitoring and determining the air quality and standardizing the method of identifying the concentration of PM10 and PM2.5 in the ambient air. Namely, the current standard identifies the concentrations limits for the following 10 pollutants: B[a]P, CO, F, NO₂, NO_x, O₃, Pb, PM10 and SO₂ in ambient air.

According to the air quality survey in the Report on The State of The Environment of China 2010 (SOE, 2010), the air quality in urban areas in China was good, however, some cities suffer major pollution measured by the acid rain frequency and pH value. In Table 2.3.1, the air quality among the 113 key cities, the cities that met Grade I air quality standard decreased from 29.2% in 2004 to 0.9% in 2010, those met Grade II increased from 45.1% in 2004 to 72.6% in 2010, those met Grade III decreased from 45.1% in 2004 to 25.6% in 2010, and those worse than Grade III decreased from 25.7% in 2004 to 0.9% in 2010. According to the Annual Report on Prevention and control of Vehicle Pollution in China (2010) released by MEP, the main pollutants are the heavy emissions from the accelerating number of vehicles in China. CO and hydrocarbon emissions from vehicles exceed 70%, and NO_x and PM₁₀ emissions from vehicles exceeded 90%, of which automobiles are the main contributor to total vehicle emissions.

41

http://english.mep.gov.cn/standards_reports/standards/Air_Environment/quality_standard1/200710/t20071024_111819.htm

Figure 2.3.1: Air Quality of 113 Major Cities in China 2004-10

Year \ Grade	2004	2005	2006	2007	2008	2009	2010
Grade I	N/A	1.8%	N/A	N/A	N/A	0.9%	0.9%
Grade II	29.2%	40.7%	44.2%	44.2%	57.5%	66.4%	72.6%
Grade III	45.1%	51.3%	48.7%	54.9%	41.6%	32.7%	25.6%
Grade IV & beyond	25.7%	6.2%	7.1%	0.9%	0.9%	0.0%	0.9%

Source: Ministry of Environmental Protection of the People's Republic of China, Report on The State of The Environment of China 2004-10

Environmental quality standard for surface water⁴² (GB 3838-2002, effective on Jun 1st 2002):

Along with the Environmental Protection Law of the People's Republic of China and the Law of the People's Republic of China on Prevention and Control of Water Pollution in place, this quality standard for surface water (GB 3838-2002) aims to prevent water pollution, preserving surface water quality and eco system as well as protecting human health. This standard applies to all useable surface waters within China including rivers, lakes, canals, channels and water reservoirs.

Currently, many rivers, lakes, reservoirs and underground water systems in China are experiencing severe pollution. According to a geographical survey conducted by the Ministry of Land and Resources in 2003, about half of the cities in China have serious underground water pollution, and about 20% of all underground water in China in terms of area was contaminated and was not drinkable. The proportion of rivers being observed with drinkable water reduced from about 80% in the 1980s to less than 30% in 2010.

The major pollutants were potassium permanganate, BOD5 and ammonia nitrogen. Potassium permanganate is used in the film and television industries to produce "ancient" looks on props and costumes. BOD5 is used in breaking down organic material during wastewater treatment process. Ammonia nitrogen is used to test the quality of water going out of the wastewater treatment process. In Table 2.3.2, we can see that the MEP has been enforcing regulations to control the degree of pollution by reducing the industrial waste water discharge from 240,200 million tons in 2006 to

⁴²

http://english.mep.gov.cn/standards_reports/standards/water_environment/quality_standard/200710/t20071024_111792.htm

237,500 million tons in 2010. As the access to the nonferrous metal industry and the requirements for advanced environmentally friendly facilities (e.g. zero liquid discharge system) to maintain operation get tougher each every year, we can foresee the amount of industrial waste water discharge to continue on a declining trend in the coming years.

Figure 2.3.2: Total Discharge of Waste Water and Major Pollutants during 2006-10

Year	Waste water discharge (100 million t)		
	Total	Industrial	Domestic
2006	536.8	240.2	296.6
2007	556.8	246.6	310.2
2008	572.0	241.9	330.1
2009	589.2	234.4	354.8
2010	617.3	237.5	379.8

Source: Ministry of Environmental Protection of the People's Republic of China, Report on the State of the Environment in China 2010

Figure 2.3.3: Selected Environment Related Legislation

Year	Legislation
1979	Environmental Protection Law (amended 1989 and 2001)
1982	Marine Environmental Protection Law (amended 1999)
1984	Forest Law (amended 1998)
1984	Law on Prevention and Control of Water Pollution (amended 1996, implemented 2000)
1985	Grassland Law
1986	Fisheries Law
1986	Mineral Resources Law
1986	Law on Land Administration (amended 1998)
1987	Law on Prevention and Control of Air Pollution
1988	Water Law (amended 2002)
1988	Wildlife Protection Law
1989	City Planning Law
1991	Law on Animal and Plant Quarantine
1991	Law on Water and Soil Conservation
1993	Agricultural Law
1994	Regulations on Protected Areas
1995	Law on Prevention and Control of Environmental Pollution by Solid Waste (amended 2004)
1995	Law on Prevention and Control of Air Pollution (amended 2000 and 2002)
1996	Law on Prevention and Control of Pollution from Environmental Noise
1996	Law on Coal Industry
1997	Law on Protecting Against and Mitigating Earthquake Disasters
1997	Law on Energy Conservation
1997	Construction Law
1997	Flood Control Law
1998	Fire Control Law
1998	Law on Promotion of Cleaner Production (amended 2003)
1999	Administrative Reconsideration Law
1999	Meteorology Law

2001	Law on Prevention and Control of Desertification
2001	Law on Administration of Sea Areas
2002	Law on Popularization of Scientific Technology
2002	Law on Safety Production
2002	Law on Environmental Impact Assessment
2003	Law on Radioactive Pollution Prevention and Control
2003	Law on Administrative Permission
2005	Law on Renewable Energy

Source: OECD. (2007). Environmental Performance Reviews: China.

Figure 2.3.4: Environment Related Administrations

Responsibilities	Entities
Macro-coordination and control	National Development and Reform Commission (NDRC)
	Ministry of Finance (MOF)
	Ministry of Foreign Affairs (MOFA)
Pollution Control	State Environmental Protection Administration (SEPA)
	Ministry of Construction (MOC)
	Ministry of Railways (MOR)
	Ministry of Communications (MOCO)
	Ministry of Water Resources (MOWR)
	Ministry of Health (MOH)
Ecosystem protection	Ministry of Environmental Protection (MEP)
	Ministry of Agriculture (MOA)
	State Forestry Administration (SFA)
	Ministry of Land and Resources (MOLR)
Natural resource management	State Environmental Protection Administration (SEPA)
	Ministry of Land and Resources (MOLR)
	Ministry of Water Resources (MOWR)
	Ministry of Agriculture (MOA)
	State Forestry Administration
Others	Ministry of Science and Technology (MOST)
	Ministry of Education (MOE)
	State Oceanic Administration (SOA)
	National Audit Office
	General Administration of Civil Aviation
	General Administration of Customs
	State Administration of Taxation

Source: OECD. (2007). Environmental Performance Reviews: China.

One of the critical environmental issues in China is the illegal trans-boundary movement of the waste electrical and electronic equipment (WEEE, a.k.a. e-waste), which contains lead,

cadmium, mercury, chromium, and polyvinyl chloride. All these materials known to have toxicological effects include brain damage, kidney diseases, mutations, and cancers. As NFM recyclers import secondary materials from overseas markets, they often contain a relatively small amount of WEEE; NFM recyclers often face the risk of having their businesses suspended, or at worst case, sentenced to jail, if any WEEE is found in their importing containers by Chinese customs. Therefore, it is suggested that not only NFM recyclers in China should make enormous effort to maintain good relationship with the Chinese customs as well as the local governments, but should also ensure that their imports contain none of the WEEE before shipping.

Section 4. ADVANTAGES AND CHALLENGES OF NFM RECYCLING

Recycling nonferrous metals reduces greenhouse gas emissions and saves energies and resources used in primary production. Also, it costs less to produce nonferrous alloy ingots by adding recycled nonferrous metal scraps in the melting process, rather than adding just pure nonferrous metals in such process. Many merits to recycle nonferrous metals are as follow:

- Recycling aluminum saves up about 95%⁴³ of the energy used in primary production, and reduces CO2 emissions about 92%⁴⁴.
- Recycling copper saves up about 85%⁴⁵ of the energy used in primary production, and reduces CO2 emissions about 65%⁴⁶.
- Recycling zinc saves up about 60%⁴⁷ of the energy used in primary production, and reduces CO2 emissions about 65%⁴⁸.
- Recycling lead saves up about 65%⁴⁹ of the energy used in primary production, and reduces CO2 emissions about 99%⁵⁰.

⁴³ <http://www.bir.org/industry/non-ferrous-metals/>

⁴⁴ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁴⁵ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁴⁶ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁴⁷ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁴⁸ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁴⁹ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁵⁰ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

- Recycled aluminum supplies about 33%⁵¹ of the world's demand for zinc.
- Recycled copper supplies about 40%⁵² of the world's demand for copper.
- Recycled zinc supplies about 30%⁵³ of the world's demand for zinc.
- Recycled lead supplies about 35%⁵⁴ of the world's demand for zinc.

Nonferrous recycling industry in China encounters two key challenges that present negative impacts to the industry.

1. Ability to secure secondary nonferrous metals

China is still in the middle of the industrialization stage, thus one can foresee the imports of secondary nonferrous metals would be an important source of supply of many key non-ferrous metals. As the global competition for secondary nonferrous metals intensifies, China faces four key issues:

- Import taxes of secondary nonferrous metals are up to 17% in China; in other main importing countries, import taxes of secondary coppers and secondary aluminum are only 5% and 0%, respectively.
- The cost of production increases steadily each year. Such as rising labor cost, material cost, energy cost, and necessary investments for Industrial upgrading.
- To secure metal resources, many countries have strengthened policies that limit the exports of secondary nonferrous metals, in particular, high-quality secondary metals.
- As Chinese government strengthens regulations regarding imports of secondary metals, it increases the cost and time to pass through the custom's inspection. As a result, it negatively affects firms' margin and imports of secondary metals into China.

2. Currency exchange rate fluctuations

In recent years, the volume of imports of secondary nonferrous metals is at least US\$8 billion, and this amount reduces the trade surplus while alleviates international trade disputes. As US

⁵¹ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁵² Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁵³ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

⁵⁴ Ibid, <http://www.bir.org/industry/non-ferrous-metals/>

dollar strengthens, prices of raw materials rises. The reason is because the transactions all are made by US dollars.

Section 5. OPERATING CONDITIONS

As of today, there is no major player that operates automobile recycling and shredding facilities in China. All the waste automobiles in China are currently processed manually in small amounts at an inefficient pace. Therefore, the main sources of nonferrous metal scraps today are mostly from the waste automobile recyclers in US and Europe. Hence, to run a (median size or above) nonferrous metal recycling factory in China, one needs to import his/her supplies from US & Europe with both a China Certification & Inspection license (CCIC) and an import license for nonferrous metal scraps, the 7th category in the list below (Figure 2.3.1 Restricted Import of Solid Waste That Can Be Used As Raw Materials in China).

Figure 2.5.1: Restricted Import of Solid Waste That Can Be Used As Raw Materials

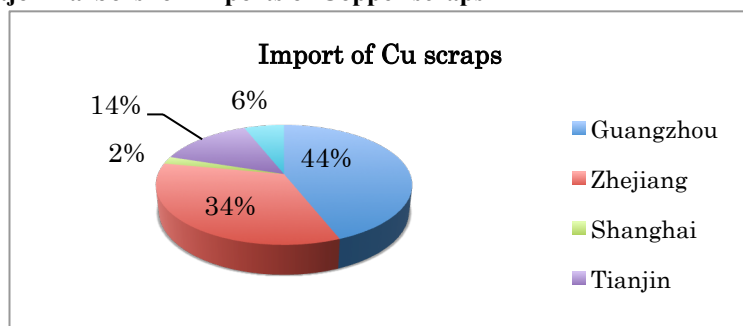
1 st	GB 16487.1-2005	waste of bones
2 nd	GB 16487.2-2005	smelt slag
3 rd	GB 16487.3-2005	wood and wood articles
4 th	GB 16487.4-2005	waste and scrap of paper and paperboard
5 th	GB 16487.5-2005	waste and scrap of fibres
6 th	GB 16487.6-2005	waste and scrap of iron and steel
7 th	GB 16487.7-2005	nonferrous metal scraps
8 th	GB 16487.8-2005	waste of electric motors
9 th	GB 16487.9-2005	waste and scrap of wires and cables
10 th	GB 16487.10-2005	metal and electrical appliance
11 th	GB 16487.11-2005	waste and scrap ships
12 th	GB 16487.12-2005	waste and scrap of plastics
13 th	GB 16487.13-2005	compressed piece of scrap automobile

Source: Chinese Law: http://www.proimex.it/index.php?option=com_k2&view=item&id=1:normativa-cinese&Itemid=18&tmpl=component&print=1&lang=en

China's recycling industry mainly locates near coastal region, and extends into inland provinces such as Hunan, Anhui, Jiangxi, Hubei, and Yunnan. The major harbors for imports of copper in 2011 are shown in Figure 2.3.2. The harbor in Guangzhou province had the most volume among the major harbors with 44% of the total import of copper scraps, and the harbor in Zhejiang

province was the second with 34%. The major harbors for imports of aluminum in 2011 are shown in Figure 2.3.3. The harbor in Guangzhou province had the most volume with 60% of the total import of aluminum scraps, the harbor in Shanghai region with 20%, and the harbor in Zhejiang province with 5%. As most of the ferrous/nonferrous metal related industries locate in Zhejiang and Shanghai, the harbor in Zhejiang is ideal for importing. However, The harbor in Guangzhou had the largest amount of import was because many trading companies engage in trading secondary metals in Guangzhou, and thus accumulated a huge amount of such imports.

Figure 2.5.2: Major Harbors for Imports of Copper scraps



Source: The Yearbook of Nonferrous Metals Industry of China 2011

The level of regulation in the NFM recycling industry is high, and trend for requirements to obtain such import license are increasing, as the Ministry of Environmental Protection of the People’s Republic of China demands players in the nonferrous recycling industry to have advanced environmental protection facilities that meet the Ambient Air Quality Standard (GB3095-1996, effective Oct 1st 1996) and Environmental Quality Standard for Surface Water (GB 3838-2002, effective on Jun 1st 2002) (OECD Environmental Performance Reviews: China)

Conditions for Start-ups:

As problems of environmental pollution worsen every year, more requirements are needed to build a factory. The procedure before receiving a license to operate a factory is as follows:

1. To provide the local government with an address of the plant. If it is a rental land, one should provide the rental contract. If it is owned, one should provide a proof of land-ownership.

2. To provide the local government with a feasibility report and/ a business plan including the type of project you would like to engage in, the amount of capital you would like to invest, the amount of profit you expect, and etc.
3. To submit a form of enterprise investment plan to National Development and Reform Commission (中華人民共和國國家發展和改革委員會), which includes details of factory construction, amount of investment, and the rest varies regionally.
4. To provide a Land for Construction Plan Permit, if one owns the plant.
5. To provide a detailed plant layout and a list of facilities that meets the standards set by MEP, in particular, noise isolation, water, and air filtration facilities. More specific, one needs to provide a fume filtration plan for the kitchen.
6. To provide a detailed procedure of processing and production of one's product(s).
7. To find a qualified environmental protection unit to examine one's plant facilities, written in one's business plan, and to report the following result to the local Ministry of Environmental Protection.
8. If one's plant meets all the requirements set by MEP, one would be allowed for an operation trial for three months.
9. After three months of operation, a list of environment-related criteria would be examined again by MEP. And, if approved, one receives a permission license to operate the plant.

Three additional requirements set by MEP once gain access to operate:

- Processes of separation, sorting and melting have to be in-door with all windows closed.
- Every workshop and warehouse has to be properly labeled with a sign stating its purpose of use at its door.
- Imports of secondary materials, finished goods, and non-recyclable wastes must be recorded when going in and out from the factory.

The purpose of these meticulous procedures mentioned above, set by both the China

Nonferrous Metals Industry Association Recycling Metal Branch (CMRA) and Ministry of Environmental Protection of People's Republic of China (MEP), is to aim for a healthy balance of economic growth, consumption of energy, and environmental protection. In seeking such healthy balance, CMRA has further revised the entry requirements for both aluminum and copper recycling and refineries:

1) Secondary Aluminum:

Permissions for operation will be given to new entrants that have annual production capacity of 100,000 tons and above. CMRA encourages current players to increase their annual production capacity to at least 50,000 tons. CMRA will eliminate those consume 4 tons of fuel oil and coal worth of energy annually and those with annual production capacity of 10,000 tons and below. Furthermore, CMRA will phase out those with annual production capacity of 30,000 tons and below before the end of 2013.

2) Secondary Copper:

Permissions for operation will be given to new entrants that have annual production capacity of 100,000 tons and above. CMRA encourages current players to increase their annual production capacity to at least 50,000 tons. CMRA will phase out those with annual production capacity of 20,000 tons and below before the end of 2013, and those with annual production capacity of 50,000 tons and below before the end of 2015.

CHAPTER3. LITERATURE REVIEW

Section 1. TRADITIONAL PERFORMANCE EVALUATION SYSTEM

Entering Information age, the already competitive business environment has become more complicated as product life cycles continue to shrink. For information age companies, intangible assets are more important than physical and tangible assets for success. Based on the financial accounting model (Kaplan & Norton, 1996), traditional performance evaluation system narrowly focuses on financial figures and functional level performance that often fail to seize long-term organizational success. Ideally, financial accounting model should have included both tangible and intangible assets, such as high-quality products and services, motivated and skilled employees, high-quality and flexible internal processes, satisfied and loyal customers. Some argue that traditional performance evaluation system have the following blind spots:

- Unable to adopt the continuous change of external environment
- Not associated with enterprise's strategic planning and market competitive advantage
- Unable to help enterprise to overcome the obstacles when executing strategies
- Unable to assist enterprise to predict future trends
- Lack of guidance and functions that encourage employees to learn and be creative
- Unable to satisfy various needs of customers

Moreover, enterprise conducting centralized management style use key factors such as productivity, profitability, earning power, growth, and other financial indicators to measure their performances, with an emphasis on the division of labor and the standardization of production. Traditional performance evaluation system tends to weigh more on the term "control" (Xu Shi Jun, 2000), with two types of manners: active and passive. Passive enterprises immediately acknowledge a problem when taken place and try to revise the current strategy to resolve it. On the other hand, with the establishment of performance evaluation system, active enterprises hope to achieve goal congruence of the individual efforts and organizations' targets. Whether active or passive, most traditional performance evaluation systems demand the following four principles (Chen, C. B.):

- We get what we measure
- Clearly address what we emphasize to employees
- Clearly let employees know what behavior will be encouraged
- Not only stress what employees should do, but also advise them how well they should do

Section 2. BALANCED SCORECARD

In 1990, KPMG's research fund, Nolan & Norton, gathered many top executives from 12 enterprises on a research project that studied performance evaluation system for the new era that did not rely heavily on financial measures, while providing enterprises the ability of creating future economic values (Kaplan & Norton, 1996). Kaplan and Norton were deeply inspired by a renowned British scientist, Lord Kelvin, who once said (Kaplan, 2010. Conceptual Foundations of the Balanced Scorecard, pp. 3):

“I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind.

If you can not measure it, you can not improve it.”

Along with the traditional performance evaluation based on financial measures research team invented another three structures: customer, internal process, and learning and growth. As a result, Kaplan and Norton introduced Balanced Scorecard (BSC) in a 1992 Harvard Business Review article. Kaplan and Norton described Balanced Scorecard as a required navigation equipment and command instrument for enterprises in this information age. Balanced Scorecard 1) could work as an internal communication platform for the organization's strategies; 2) could provide

a clear organizational strategy map; 3) could consolidate the direction of individuals and the organizational efforts; 4) could further enhance the organizational internal efficiency and external core competitiveness.

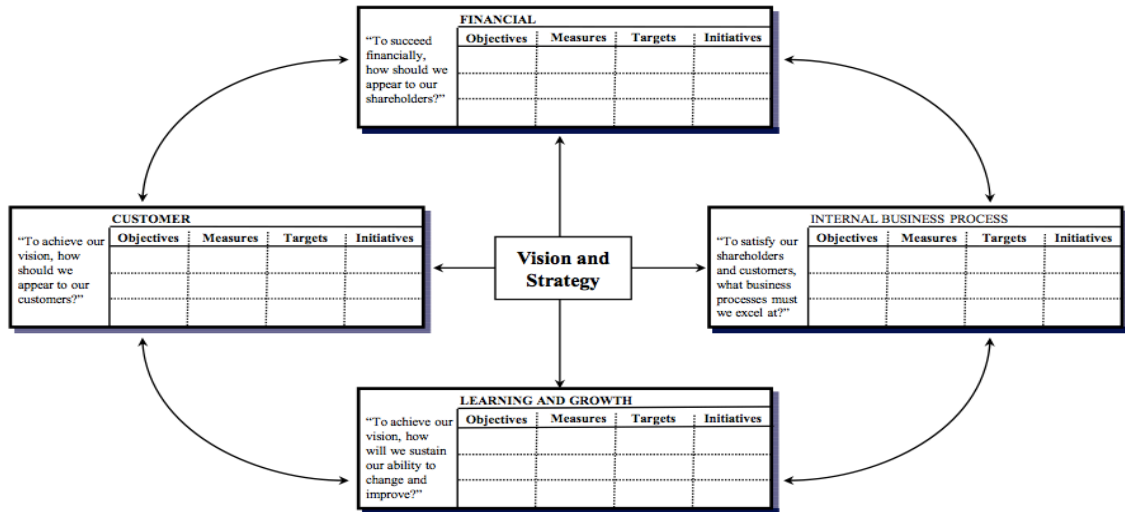
In the early stage, the concept of Balanced Scorecard was derived by the idea, responsibility accounting, which is the product of the modern decentralized management style and also the prototype of modern management control system. Responsibility accounting is an underlying concept of controllability. In general, a large organization should be decentralized into manageable segments, and a manager of each segment is held responsible for the performance of the work that he or she can control. "Responsibility accounting states that a person should be evaluated only on the basis of those factors that he controls. This is usually interpreted to mean that a person should be evaluated only on the basis of those outcomes that he affects" (Baiman and Noel, 1982, p.197).

The advantage of responsibility accounting is that lower-level managers allow higher-level managers to work on other important tasks such as long term planning and policy making. In addition, managers and workers tend to be motivated in such individualistic system. However, managers and workers from different segments tend to compete to optimize their own individual performances rather than working together to optimize the overall performance of the system, which many critics refer to as the "stovepipe organization" and "functional silos" (Hammer & Champy, 1994).

To respond to the conflict between segment and overall performance, short term and long term performance, Kaplan and Norton proposed BSC to reach the following balances (1992):

- Balance between short term and long term goals.
- Balance between financial and nonfinancial metrics.
- Balance between lagging and leading indicators.
- Balance between aspects of internal and external performance

Figure 3.2.1: Translating Vision and Strategy: Four Perspectives



Source: Kaplan & Norton, *The Balanced Scorecard: Translating Strategy into Action*, 1996, p. 36

The Balanced Scorecard places an emphasis on financial measures as the most important measures for a company's success, but also harmonizes these financial measures with three additional drivers - customer, internal process, and learning and growth - to maximize long-term shareholder value as the ultimate goal.

1) Financial:

Financial perspective is a lagging indicator that reflects something already took place. Core financial measures include 1) Return-on-investment/economic value-added; 2) profitability; 3) revenue growth/mix; 4) cost reduction productivity (Kaplan & Norton, 1996).

2) Customer:

Customer perspective is a leading indicator: if customers are not satisfied, they will eventually find other suppliers that will fulfill their needs. Although a snapshot of the current financial measures may seem excellent, poor performance in customer perspective can lead to a future decline. To develop metrics for good performance, we need to analyze which segment does a customer belong to and what kind of product and/ service does that customer need. In addition, the core customer measures include: 1)

market share; 2) customer acquisition; 3) customer retention; 4) customer profitability; 5) and customer satisfaction (Kaplan & Norton, 1996).

3) Internal Process:

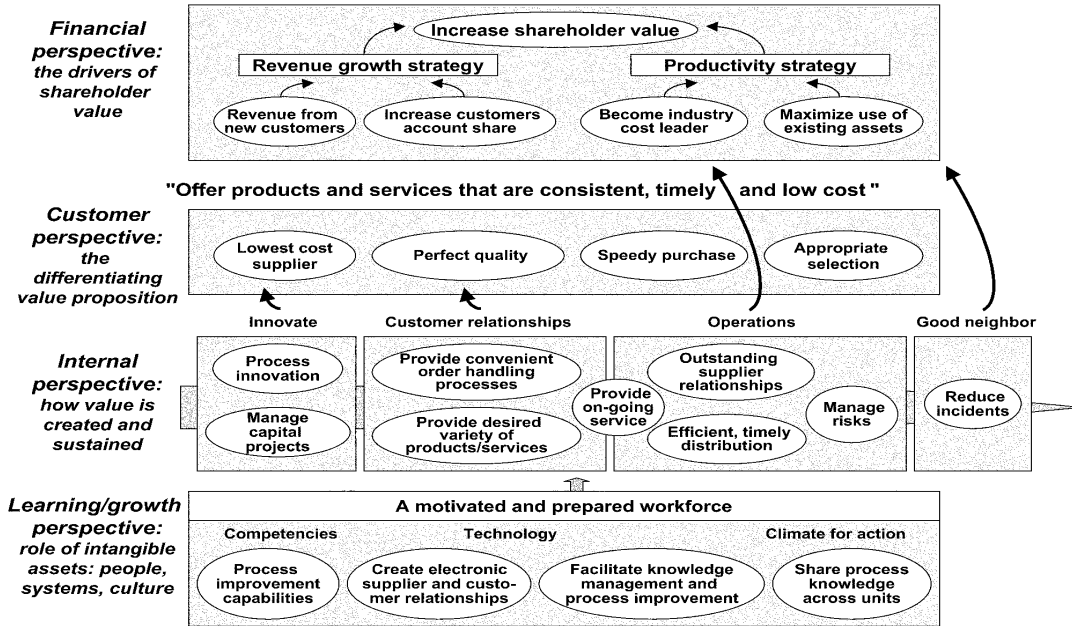
Metrics in internal process perspective allow the managers to see how well their business is performing, and whether the products and services meet the customer's needs. The biggest difference between Balanced Scorecard and traditional performance evaluation system is that Balanced Scorecard emphasizes on the innovation processes to conform customers' needs and fulfill shareholders' expectation (Kaplan & Norton, 1996).

4) Learning and Growth:

Learning and growth perspective provides foundation for employee training and corporate culture related to both individual and corporate self-improvement, and contribute to corporate's long term growth as a whole. Core learning and growth measures include 1) employee satisfaction; 2) employee retention; 3) employee productivity (Kaplan & Norton, 1996).

On the basis of improving the performances in terms of customer and financial perspectives, Balanced Scorecard identifies key competitive drivers, and merge them with innovative ideas to motivate an organization for future overall performance. On the other hand, traditional performance evaluation system emphasizes on monitoring, control, and revise the current internal processes. In the book, "The strategy-focused organization, how balanced scorecard companies thrive in the new business environment" (Harvard Business School Press, 2000), Kaplan and Norton introduced the strategy map (Figure 3.2.2), a logical architecture that defines a strategy by specifying the links between shareholders, customers, business processes and competencies while making sure balanced scorecard is linked to the organization's strategy.

Figure 3.2.2: Example of a “value for money” strategy map



Source: R.S. Kaplan, Building strategy Focused Organizations with the Balanced Scorecard; Presentation during the Third International Performance Measurement and Management Conference, Boston, July 2002)

In a survey conducted in 2004 studying the satisfaction rate of the management tools and techniques (see Figure 3.2.3), the satisfaction rates of the use of Balanced Scorecard from major industries received the highest rating with an average satisfaction rating of 83%, ranked 1st place, and was 16% more than that of 2nd place, Supply-chain management. Based on this ranking, the advantages of Balanced Scorecard proved to be indispensable for the performance evaluation and management tool for the enterprises today.

Figure 3.2.3: Satisfaction Rate of Various Types of Management Tools/Techniques

Industry Tool/ Technique	High Tech			Manufacturing			Service			Other	Avg.
	Electronic computer, etc.	Semi-conductor	Photo-electric	Precision Machinery	Motor	Plastics & Textiles	Bank & Ins.	Trading & Wholesale	Securities		
BSC	87%	92%	88%	79%	78%	81%	82%	83%	80%	81%	83%
SCM	76%	77%	75%	68%	68%	71%	66%	68%	66%	61%	69%
Direct Mgmt.	71%	64%	70%	66%	68%	67%	69%	63%	65%	66%	67%
TQM	63%	67%	66%	59%	58%	60%	64%	69%	68%	65%	65%
PLM	74%	75%	71%	67%	66%	55%	62%	66%	62%	51%	64%
CRM	64%	65%	61%	57%	56%	65%	72%	56%	72%	64%	63%
Bdgt. Mgmt.	55%	59%	60%	51%	53%	52%	57%	61%	53%	55%	56%
Trad'l Perf. Eval.	49%	52%	54%	55%	56%	58%	54%	59%	52%	55%	54%
ERP	54%	50%	51%	47%	56%	45%	52%	46%	52%	51%	51%
EVA	54%	53%	57%	45%	44%	48%	49%	53%	50%	51%	49%
ABC	52%	52%	50%	42%	41%	42%	47%	42%	48%	49%	47%
6 Sigma	45%	45%	47%	46%	48%	47%	41%	45%	47%	41%	46%
BPR	43%	41%	42%	42%	43%	39%	39%	39%	41%	41%	42%
Knowledge Mgmt.	44%	45%	47%	38%	38%	37%	45%	37%	44%	44%	41%
Others	34%	38%	42%	38%	40%	35%	33%	41%	41%	41%	37%

Source: 于泳泓 & 陳依蘋, 平衡計分卡完全教戰手冊, 2004

Section 3. PROS AND CONS

The purpose of Balanced Scorecard is to implement balanced management system to strategically align business practice and goals to gain competitive advantage. It more effectively positions HR to assume a role at the executive table as a source of collected data and analytics, and manager of tangible and intangible assets – synergy of business outcomes that are difficult to imitate, (Fottler, 2006). It also supports talentship (Boudreau, 2002), intellectual capital (Wu, 2005), and human capital as a strategic asset, and not as a financial cost, (Becker, 2001). Moreover, it is versatile for both large and small and medium enterprises (SME) companies, (Rompho, 2011) and public and private organizations. In other words, it has the potential and flexibility to help organization in today's ever-changing markets to deal with volatile changes and transformations as it can be simplified for smaller businesses, (Afonso and Cunha, 2010). Overall, the Balanced Scorecard has become widely used in large companies in the U.S.. For instance, 40% of the

companies in the Fortune 500 and 60% of the Fortune 1000 have already implemented Balanced Scorecard to improve planning, monitoring and evaluation performance functions (Chow and Haddad, 1997). The advantages of Balanced Scorecard can be summarized as follow:

1. Presents clear organizational goals in a single chart with relatable indicators links to four core perspectives; all employees are able to understand the strategy and the vision of the organization, and to see how well they perform at each performance evaluation meeting.
2. Provides a synergy of all the departments, such as HR, operation, and Finance
3. Advanced training is not required to implement a simple version of Balanced Scorecard as it is usually straightforward enough to be used by many managers once gained familiarity of the concept.

On the other hand, there are several problems associated with the implementation and maintenance of Balanced Scorecard. First, the biggest problem is the lack of qualified personnel to be in charge of implementation. Generally, companies purchase Balanced Scorecard software, hire consultants to develop their Balanced Scorecards to evaluate their performances. However, they may not have qualified personnel with sufficient knowledge on Balanced Scorecard, and the employees usually do not participate in the discussion of strategy and development of key performance indicators (KPIs). That is to say, to successfully implement Balanced Scorecard, it is necessary that employees of an organization have at least some basic understanding of the framework. Second, the lack of a good strategy is another common mistake that leads to failure of Balanced Scorecard. If there is no strategy, it is difficult to evaluate the implementation of Balanced Scorecard as it is fundamentally built on the development of a comprehensive strategy. Third, selecting the proper KPIs is crucial for the success of the implementation of Balanced Scorecard. Evaluating the wrong KPIs results in analysis of wrong information. For instance, the KPIs for manufacturing may vary from KPIs for Hospitality (i.e. hotels and restaurants) industry. The disadvantages of Balanced

Scorecard can be summarized as follow:

1. Balanced Scorecard performance is subjective; it cannot be quantified except by surveys or management opinion, and survey interviewers need the participation of both the CEO and the top management in order to extract the critical information, such as the gap between how the CEO and the top management perceive, for building Balanced Scorecard for the organization.
2. Balanced Scorecard requires long term commitment to be implemented as performance evaluation meetings with the participation of all department heads take place quarterly in an organization. During each performance evaluation meeting, the CEO or the top management should add, retain, or eliminate any appropriate measures.
3. Due to a relatively large required number of HR staff in an organization, the implementation of Balanced Scorecard is costly for SMEs with number of staff under 80.
4. When a company fails to reach its Balanced Scorecard goals, such goals may be re-interpreted as current key issues to be resolved.

CHAPTER4. OUTLINE OF LIVION

Section 1. ABOUT LIVION

Founded in 1995, Livion Metal Industry Co. Ltd. (LMI), a nonferrous metals recycling and zinc smelting company with about 400 employees and based in Ningbo, Zhejiang Province, China. Livion imports on an annual average of 55,000 tons of secondary scrap metals and 32,000 tons of waste motors and electric generators, of which 40% are from West Europe, 55% from North America, and 5% from others (i.e. Japan, South Africa, South America, East Europe and etc.). It generates an annual average of turnover of \$135 million in USD by 1) sorting and wholesaling secondary non-ferrous metal scraps; 2) dismantling and wholesaling waste motors and electric generators; 3) producing and selling zinc alloy ingots. Each of the three categories generates equal revenue distribution of 33.33% from the downstream industries.

Livion's current customer base that locates within Zhejiang province, Jiangsu province, and Shanghai region are the following groups:

1. Secondary nonferrous scrap metals:

After washing and sorting nonferrous scrap metals into piles of each type, Livion sells them to manufacturers of aluminum, copper (e.g. copper sticks), and stainless steel products.

2. Zinc alloy ingots:

Livion melts the recycled zinc scraps and produces zinc alloy ingots targeting manufacturers in the medium segment including die-casting for automobile parts (e.g. emergency brake), bathroom devices, stationary, electronic appliances, door locks, and decorations.

3. Waste transmission and electric generators:

Livion dismantles the waste transmission and electric generators, and sells them to factories mainly including both ferrous and nonferrous metal smelting and refineries.

Figure 4.1.1: Country Origins of Supplies of Secondary Nonferrous Materials

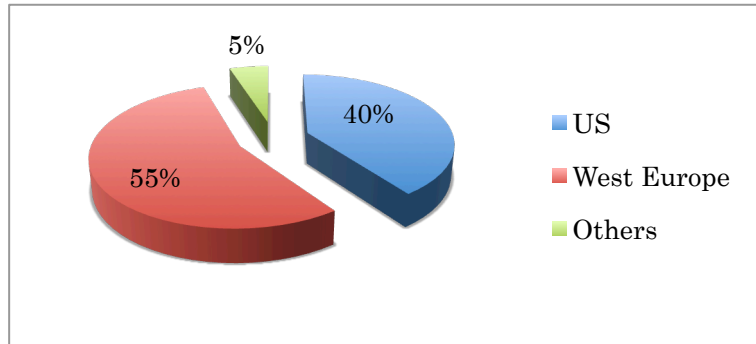


Figure 4.1.2: Revenue Distribution of Livion

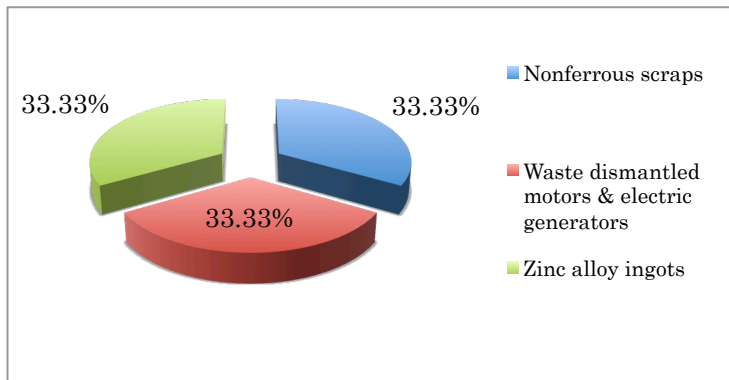


Figure 4.1.3: Organizational Chart of Livion

L.M.I. CO. Organization Chart

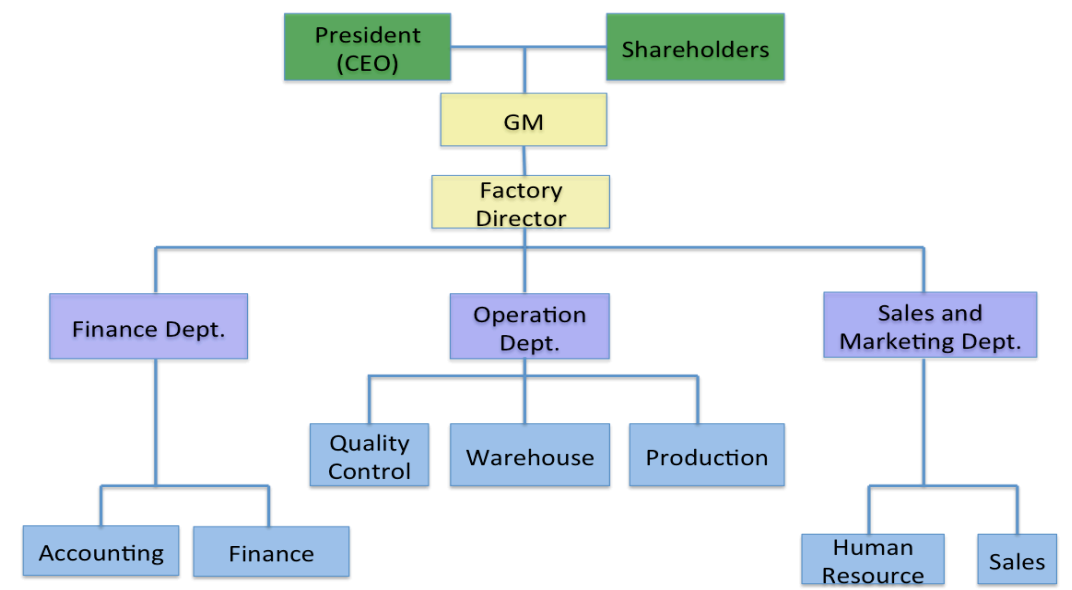


Figure 4.1.4: Milestones of Livion

1995	➤ Founded in Ningbo City, Zhejiang Province, China, as a metal recycling company
1998	➤ AAA Credit Rated Corporation of the Year
1999	➤ AAA Credit Rated Corporation of the Year ➤ Export Performance Excellence Award
2004	➤ Industrial Corporation Performance Excellence Award ➤ Top 10 District Tax Contributor
2005	➤ Foreign Industry Excellence Award ➤ Top 3 District Tax Contributor ➤ Corporate Performance Excellence Award
2006	➤ Top 3 Municipal Tax Contributor ➤ Top 10 National Tax Contributor
2007	➤ Recognition of Over 10 Billion (RMB) Tax Contribution ➤ Outstanding Tax Contribution Award ➤ Foreign Industry Excellence Award ➤ Top 10 National Tax Contributor
2008	➤ Outstanding Tax Contribution Award ➤ Financial Reporting Report ➤ Sichuan Earthquake Charity Award
2009	➤ Top 10 Municipal Tax Contributor ➤ Role Model in Charity Contribution Award
2010	➤ Financial Reporting Award ➤ Charity Contribution Award
2011	➤ Foreign Industry Excellence Award ➤ Top 10 National Tax Contributor ➤ Top 10 Municipal Tax Contributor ➤ Charity Contribution Award ➤ Green Management Award by Yin Zhou Project ➤ Financial Reporting Award

Figure 4.1.5: SWOT ANALYSIS OF Livion

Strengths	Weaknesses
<ul style="list-style-type: none"> ● Has license to import the 7th category of restricted waste nonferrous metals ● Established credit/reputation with foreign suppliers of waste nonferrous metals and downstream customers in Zhejiang, Jiangsu, & Shanghai region ● Good relationship with Ningbo government & custom; has been receiving top 10 municipal tax contributor award since 2004 ● Has qualified facilities that meet the environmental protection requirements set by Ministry of Environmental Protection ● Consistent and reliable product quality 	<ul style="list-style-type: none"> ● Lack innovation in sorting nonferrous metal scraps; hand-sorting method is labor intensive ● Relatively higher cost of custom duty for imports into Ningbo harbor than those into other harbors in China ● Lack promotion and learning opportunities for employees ● Lack customer evaluation system ● Lack internal cost-reduction system ● Workshops have no heater during winter, no air conditioner during summer

Opportunities	Threats
<ul style="list-style-type: none"> ● Obtain more import quotas of nonferrous metal scraps to increase business scale by expanding the size of the plant and upgrading the facilities to increase operational efficiency ● Increase the variety of alloy ingot to acquire more market share ● Expand business reach outside Zhejiang, Jiangsu, and Shanghai region ● Backward-integration to automobile recycling, dismantling and shredding business in China; acquire secondary materials from within domestic market to rely less on materials from foreign markets. 	<ul style="list-style-type: none"> ● Increasingly stricter environmental regulations; more frequent inspecting visits by Ministry of Environmental Protection ● Increasingly stricter investigation on imports by custom, no WEEE is allowed. Severe penalty if caught ● Aggressive domestic competitors with economy of scale that also have import license for the 7th category of restricted waste nonferrous metals ● Intensified global competition for secondary materials

Section 2. KEY ISSUES

Livion created a performance evaluation system 12 years ago, hoping to acquire a full understanding of its performance at the end of every year. The evaluation was set to perform at the end of every year. Livion further granted its departments the authority to decide how they wished to measure the performance of their team members by what type of indicators, such as monthly, quarterly, and yearly revenue, individual performance, and satisfactory of the employees. Nonetheless, the system was found providing some faulty conclusions regarding the company's overall performance.

In the past three years, Livion had increases in sales revenue, and thus hired more employees; however, the increase in the number of employees did not lead to an increase in organizational efficiency. According to the performance evaluation results at the end of each year and the objective financial indicators, Livion has been enjoying positive growth in all categories; however, the scale of growth has been declining. In 2012, the growth in the number of new customers was stagnant, which implied that the increase in sales was actually mostly from the

retained and loyal customers. With three more sales personnel, the sales revenue did not increase proportionately, nor were they able to acquire new customers. Therefore, the management team grew hesitant to trust the performance evaluation results generated from the sales department.

During the annual meeting, management team challenged the sales department on the progress of exploring new customers; however, the sales personnel put the blame on customers' unsatisfactory with products being overpriced. After the discussion, the management team found out that the inadequate sales expertise and knowledge about Chinese market are the key issues that caused failure to deliver the results.

By the same token, management team examined the performance evaluation and the actual operating conditions from all other departments, and discovered that there were similar issues in other departments as well. Even though the number of human resources increased, the performance did not improve relatively. In addition, there was no benchmark regarding the performance evaluation from each department. Therefore, it increased the degree of difficulty to discuss and review the current performance system. All departments agreed on the fact that the current performance system could not reflect the real internal condition of Livion, and such system needed urgent adjustment in order to improve internal organizational efficiency and external core competency.

Section 3. SOLUTION FORMING PROCESS

The main reasons for all the problems that Livion faces in the existing performance evaluation system are: 1) Loose structure; 2) Unable to link organizational goals and strategies; 3) Unable to reflect the status quo of the organization; 4) Lacking in standardized and unified measurements; 5) Unable to assist the organization to adapt to the external environment in order to enhance competitiveness. To correct the issues above, Livion needs to establish a complete set of performance evaluation system. Based on Livion's vision and organizational strategy, a functional and cross-departmental performance evaluation system can help Livion to do: 1) better adapt to external competitive business environment; 2) better predict the future trend of the market; 3) find

the direction of the organization's objectives; 4) provide a two-way communication platform between the management and employees; 5) guide the employees and the organization toward the same goals. Ultimately, this comprehensive and forward-looking performance evaluation system can be integrated into the organization's long-term planning tool.

In establishing the direction of solving the problems, primary and secondary data and relevant literature are collected in order to develop an accurate solution and a practical program. Livion has provided the related reference documents including organization chart, organization description and milestones, product/service description, historical financial reports, industry description, competitor profiles, and historical records of performance evaluation system (i.e. processes and standard documents of the performance evaluation system). In addition to the secondary data collected from Livion's official website, primary data was collected through questionnaires and in-depth interviews, in order to achieve a comprehensive data collection and fairness.

CHAPTER5. RESEARCH RESULTS

Section 1. COLLECTING SURVEY DATA

To get insightful and comprehensive information in order to construct a Balanced Scorecard for Livion., this research conducted surveys distributed only to a limited number of high executives in Livion in the following two steps:

1) First stage:

In finding out the mission, core values, and shared vision of the company, a survey was distributed to Livion's president and senior executives (Figure 5.2.2 Case Company's Business Philosophy Survey). The design of the survey consisted of a series of open-ended questions, and the respondents were asked to express their views and ideas. This survey aimed to understand Livion's business philosophy (mission, core values, and shared vision), and to help to consolidate the efforts of the individuals and the organization towards the same direction.

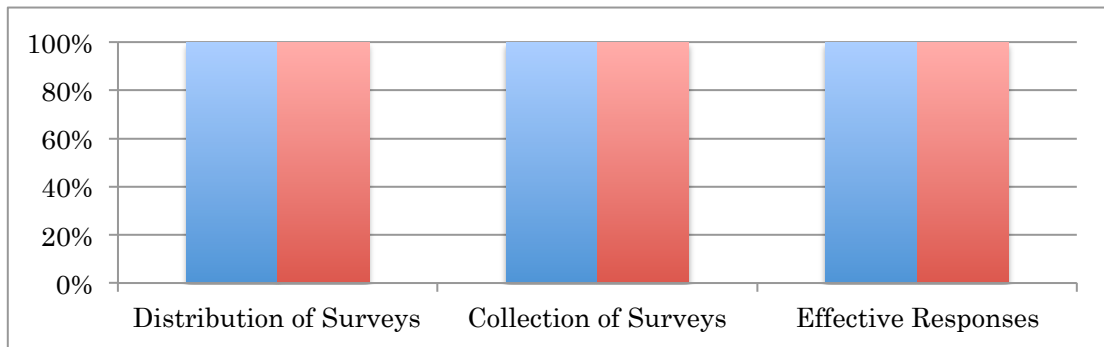
2) Second stage:

To acquire the information regarding the current condition of the business operation and to explore appropriate measurements for performance evaluation, a survey consisting of 71 questions was distributed to Livion's president and senior executives (Figure 5.2.2 Case Company's Current Condition of Business Operation). This survey composed of eight structures: 1) Leadership; 2) Strategic planning; 3) Human resources; 4) Quality control; 5) Process management; 6) Employee satisfaction; 7) Client relationship management; 8) Operating results. Based on the Graphic Rating Scale (GRS) on a scale of 10, the president of Livion rated the questions as how significant they were to the company, while senior executives rated how the company was performing at that time.

Section 2. SURVEY STATISTICS

The first stage's survey (Appendix 7.1. Case Company's Business Philosophy Survey) was distributed to and collected from the following 10 top executives of Livion including the president, the president's secretary, the general manager, the chief financial officer, two accounting managers, two sales manager, the operation manager, the human resources manger. Furthermore, the second stage's survey was distributed to and collected from the following 12 top executives of Livion including the president, two of the president's secretary, the general manger, the chief financial officer, three accounting managers, two sales managers, the operation manager, the human resources manager. Due to few numbers of questionnaire participants and strong urge by the president, the response rates of both surveys were thus 100% (Figure. 5.2.1 Condition of Survey Responses).

Figure 5.2.1: Conditions of Survey Responses - Survey Response Rate



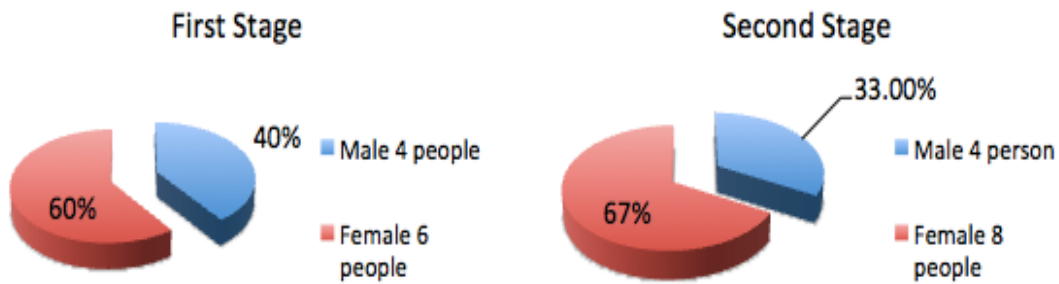
In the effective surveys, the basic information of the respondents was collected and categorized by sex, age, education level, years of service, and division:

Figure 5.2.2: Statistics of the Two-stage Surveys

Item		Stage 1: Case Company's Business Philosophy Questionnaire		Stage 2: Case Company's Current Condition of Business Operation	
		Number	Percentage	Number	Percentage
Sex	Male	4	40%	4	33%
	Female	6	60%	8	67%
Age	Age 30~35	5	50%	7	58%
	Age 36~39	3	30%	3	25%
	Age 46~	2	20%	2	17%
Education Level	High school	1	10%	1	8%
	Undergraduate	8	80%	10	84%
	Masters & above	1	10%	1	8%
Years of Service	5~10 years	3	30%	5	42%
	11~15 years	4	40%	4	33%
	16~20 years	2	20%	2	17%
	20 years~	1	10%	1	8%
Division	Management	3	30%	4	34%
	Accounting & Finance	3	30%	4	34%
	Operation	1	10%	1	8%
	Sales	2	20%	2	16%
	Human Resources	1	10%	1	8%

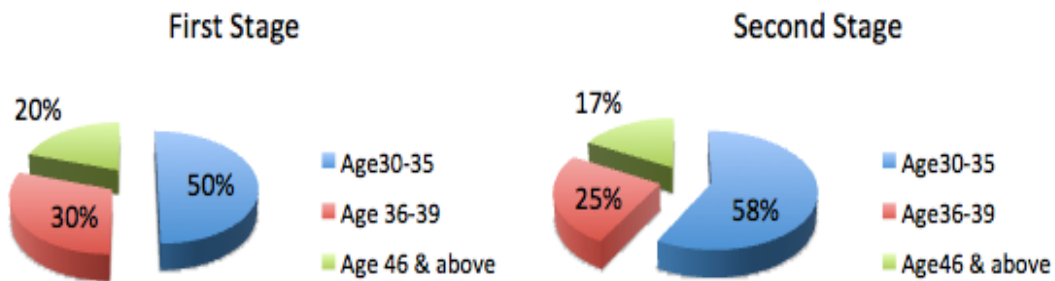
- Sex: From the two surveys, the sex ratio of the respondents does not vary significantly (Figure 5.2.3 Distribution Graphs by Total # of Participants in Two-stage Surveys). In the first survey, the sex ratio of the respondents is 4:6 (40%:60%); in the second survey, the sex ratio is 4:8 (33%:67%). This indicated that the results of the two surveys would not be varied significantly by sex.

Figure 5.2.3: Distribution Graphs by Total # of Participants in Two-stage Surveys



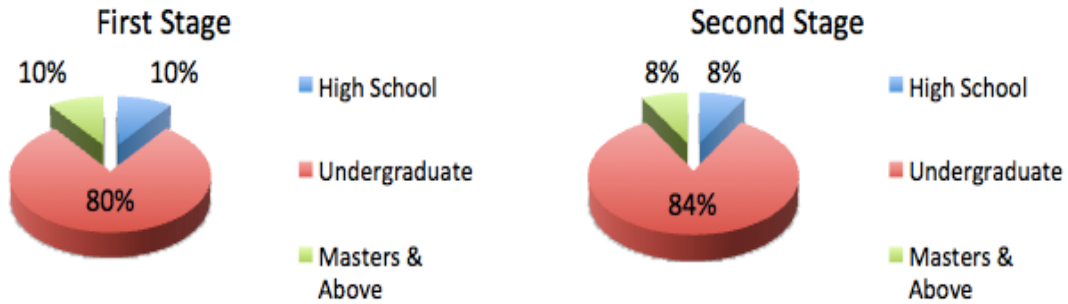
- Age: In the first survey, the average age of the respondents is 38.6 (Figure 5.2.4 Distribution Graphs by Age in Two-stage Surveys), and among which the group of age 30-35 has the most respondents that cover 50% of the total distribution; in the second survey, the average age of the respondents is 37.7, and among which the group of age 30-35 has the most respondents that cover 58% of the total distribution.

Figure 5.2.4: Distribution Graphs by Age in Two-stage Surveys



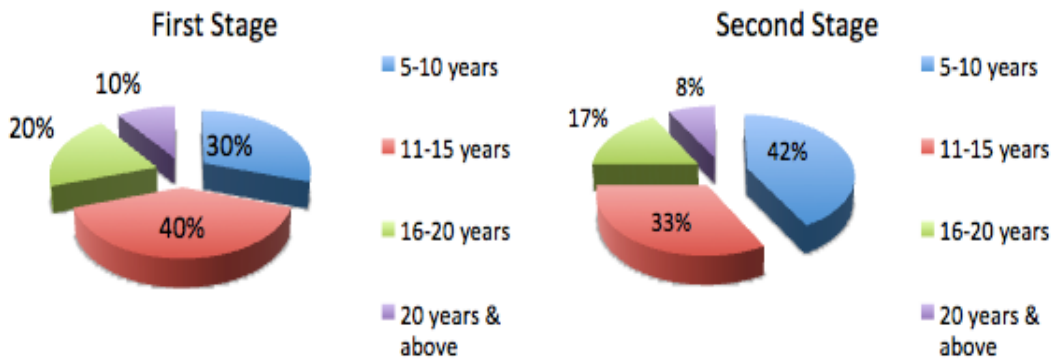
- Education Level: In the two surveys, most of the respondents have university degrees (Figure 5.2.5 Distribution Graphs by Education Level in Two-stage Surveys). 80% of the respondents have university degree in the first survey, while 84% have university degree in the second survey. More than 80% of the respondents with university degree ensure excellent quality of the two surveys.

Figure 5.2.5: Distribution Graphs by Education Level in Two-stage Surveys



- **Years of Experience:** In the first survey (Figure 5.2.6), the group with 11-15 years of experience has the most respondents with 40% of the total distribution; in the second survey (Figure 5.2.6), the group with 5-10 years of experience has the most respondents with 42% of the total distribution, while the group with 11-15 years of experience has second most respondents with 33% of the total distribution. The ratios above indicated that the respondents have sufficient knowledge and understanding about the organization, and such ratios increased the reliability and confidence level of the survey results.

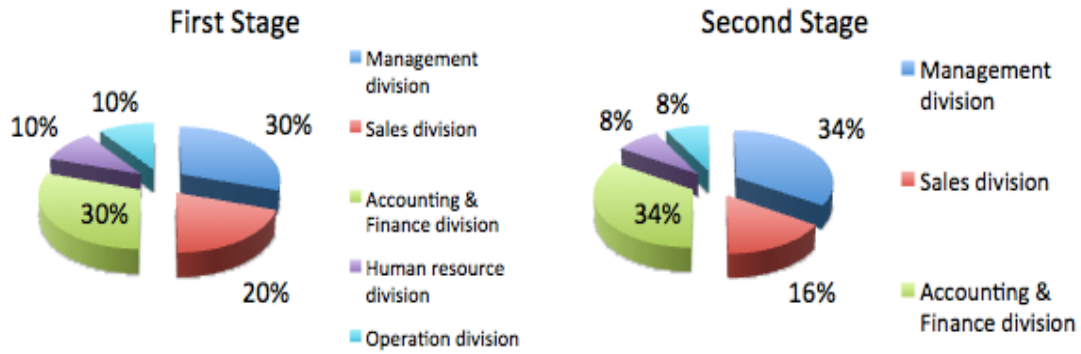
Figure 5.2.6: Distribution Graphs by Years of Experience in Two-stage Surveys



- **Division:** In the first survey, both management and accounting & finance divisions were the main groups with equal distribution of 30% each (Figure 5.2.7 Distribution Graphs by Division in Two-stage Surveys); in the second survey, management and accounting & finance divisions were also the main groups with equal distribution of 34% each. These

two divisions are the core representatives in the organization, and could provide insightful information and opinion for the implementation of Balanced Scorecard.

Figure 5.2.7: Distribution Graphs by Division in Two-stage Surveys



Section 3. ANALYSIS OF FIRST SURVEY

The management team and the senior managers of Livion have a clear consensus regarding mission, core values, and shared vision. They believe consistent product quality and excellent service are the key factors that contribute to high customer satisfaction. For example, every ton of sorted copper scraps, one of Livion’s main products, is sure to have an accuracy close to 99% of recycled scrap copper and 1% others. This would contribute to the success of downstream buyers, as they can assure their product’s quality for their customers.

Furthermore, the management team and senior managers have many ideas to describe the core values of Livion. They can be summarized by the term, TRUE:

- T: Team, Trust, Technical
- R: Respect, Responsibility, Reliability
- U: Unique
- E: Efficiency, Enthusiasm, Effect, Ethics

Employees regarding benefits and working environment in the next 5 years:

In order to retain motivated employees Livion should consider the following feedbacks

into account: 1) providing promotion and learning opportunities, and annual increase in salaries; 2) allowing better benefits including various leaves (i.e. maternity, sickness, wedding), insurance (i.e. health, medical, unemployment, retirement); 3) improving working environment such as heaters in the workshops during winter, and air conditioner during summer.

Prospect of Livion in the next 5 years (Medium term):

In order to increase business scale and achieve the target of net annual profit of 10% set by the president of Livion, it needs to consider the following steps: 1) establishing an internal management system to strengthen the control of reducing the operating cost in order to achieve any possible cost reduction in every division; 2) establishing a customer evaluation system to effectively manage quality customers; 3) continuing to upgrade and maintain the facilities to meet the increasingly stringent environmental protection standards; 4) targeting downstream buyers in Zhejiang province and Shanghai region that produce high end products using zinc alloy ingots.

Prospect of Livion in the 10 years (Long term):

Based on the findings through data and survey collected, there is currently no major player that efficiently recycles waste automobiles in large volume in China, and thus indicates that Chinese waste automobile recycling industry is still an untapped market to be explored. By pursuing backward-integration to the domestic automobile recycling business, introducing cutting-edge waste automobile recycling facilities (i.e. automobile shredding facilities, eddy-current separator) from US or Western Europe, Livion can fully source from within China, rather than relying on foreign imports of nonferrous scrap metals that are restricted by continued strengthening environmental regulations each every year. Furthermore, such backward-integration requires a huge capital investment of at least US\$3 billion, and rich experience and knowledge regarding world nonferrous metals recycling industry and world metal exchange markets (i.e. London Metal Exchange, Shanghai Futures Exchange).

Section 4. ANALYSIS OF SECOND SURVEY

The first survey aimed at collecting basic data in order to understand the current business operation of Livion; the second survey is the diagnostic questionnaire which was divided into eight dimensions: 1) Leadership; 2) Strategic planning; 3) Human resources; 4) Quality management system; 5) Process management; 6) Employee satisfaction; 7) Customer relationship management; 8) Operating results. Based on the Graphic Rating Scale method (GRS), senior executives rated subjectively how the organization currently performed on the elements in each of the eight dimensions, while the CEO rated how significant each element in each of the eight dimensions is to the organization.

Figure 5.4.1: Case Company's Current Condition of Business Operation

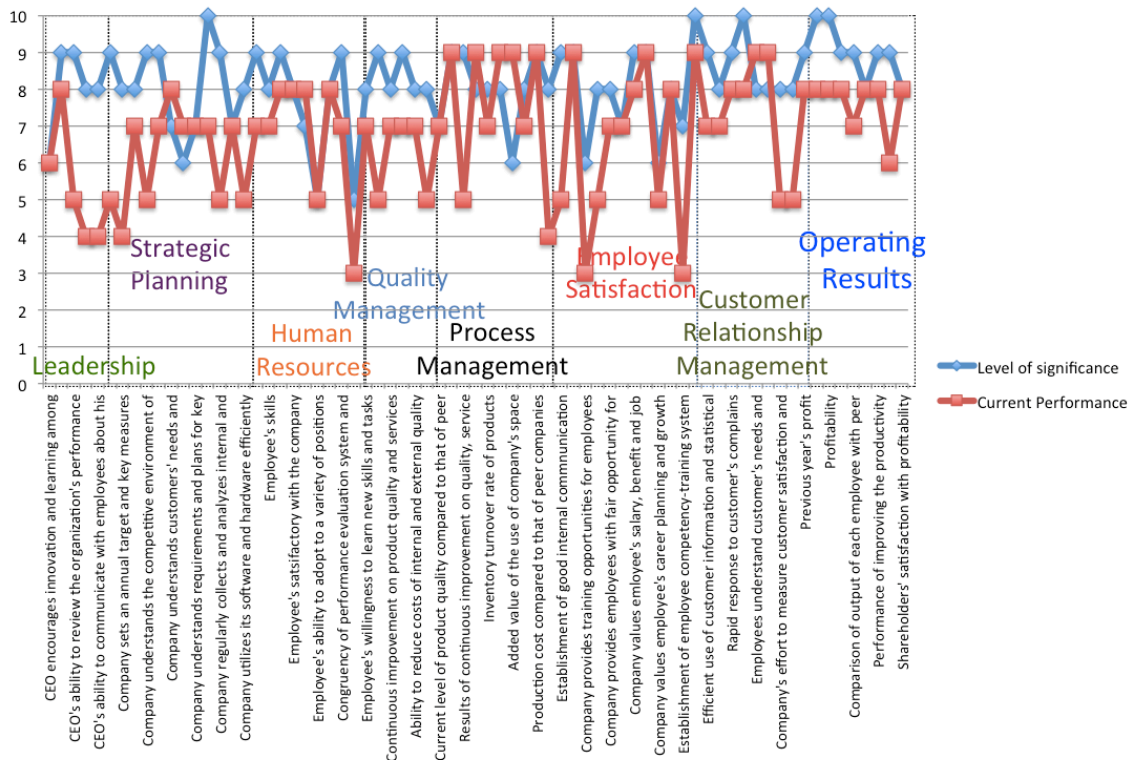
1) Leadership	Total	Current Performance	Gap	Significance to the company
(1) CEO encourages innovation and learning among employees	10	6	0	6
(2) CEO sets direction of the organization and pursues future opportunities	10	8	1	9
(3) CEO's ability to review the organization's performance	10	5	4	9
(4) CEO's ability to prioritize tasks to improve the organization's performance	10	5	4	9
(5) CEO's ability to communicate with employees about his vision and strategy	10	4	4	8
Sub-total	50	28	13	
2) Strategic Planning				
(1) Company has short and long term strategic plans	10	5	4	9
(2) Company sets an annual target and key measures	10	4	4	8
(3) Company Regularly reviews the targets for improvement	10	7	1	8
(4) Company understands the competitive environment of the market and ability to compete	10	5	4	9
(5) Company understands your need for human resource	10	7	2	9
(6) Company understands customers' needs and expectations of the product/service	10	8	1	7

(7) Company understands the abilities of its suppliers and partners	10	7	1	6
(8) Company understands requirements and plans for key human resource	10	7	0	7
(9) Company highly values strategic planning	10	7	3	10
(10) Company regularly collects and analyzes internal and external information	10	5	4	9
(11) Company constantly communicate with employees about its goals	10	7	0	7
(12) Company utilizes its software and hardware efficiently	10	5	3	8
Sub-total	120	74	27	
3) Human Resources				
(1) Employee's efficiency	10	7	2	9
(2) Employee's skills	10	7	1	8
(3) Smooth internal communication channels	10	8	1	9
(4) Employee's satisfactory with the company	10	8	0	8
(5) Employee's salary	10	8	1	7
(6) Employee's ability to adopt to a variety of positions	10	5	0	5
(7) Employee's retention rate	10	8	0	8
(8) Congruency of performance evaluation system and company's targets	10	4	5	9
(9) Budget for education and training for employees	10	3	2	5
(10) Employee's willingness to learn new skills and tasks	10	7	1	8
Sub-total	100	68	13	
4) Quality Control				
(1) Effective quality control & able to maintain customer satisfaction	10	5	4	9
(2) Continuous improvement on product quality and services	10	7	1	8
(3) Implementation of the quality control system	10	7	2	9
(4) Ability to reduce costs of internal and external quality failure	10	5	1	8
Sub-total	40	24	8	
5) Process Management				
(1) Degree of standardization of operating procedures	10	5	3	8
(2) Product quality compared to that of peer companies	10	7	0	7
(3) Production efficiency compared to	10	9	0	9

that of peer companies				
(4) Results of continuous improvement on quality, service and price	10	5	4	9
(5) Inventory turnover rate of raw materials	10	9	1	8
(6) Inventory turnover rate of products	10	7	1	8
(7) Company's internal & external problem solving ability	10	9	1	8
(8) Added value of the use of company's space	10	9	3	6
(9) Cost of poor products compared to that of peer companies	10	7	1	8
(10) Production cost compared to that of peer companies	10	9	0	9
Sub-total	100	76	14	
6) Employee Satisfaction				
(1) Quick response to employee's problem	10	4	4	8
(2) Establishment of good internal communication channels	10	5	4	9
(3) Establishment of good appraisal system to motivate employees	10	9	0	9
(4) Company provides training opportunities for employees	10	3	3	6
(5) Company values the importance of working environment	10	5	3	8
(6) Company provides employees with fair opportunity for development	10	7	1	8
(7) Company values employee's health and safety at work	10	7	0	7
(8) Company values employee's salary, benefit and job security	10	8	1	9
(9) Company values maintenance of employee's relationship	10	9	0	9
(10) Company values employee's career planning and growth	10	5	1	6
(11) Company's goal-setting and evaluation methods	10	8	0	8
(12) Establishment of employee competency-training system	10	3	4	7
Sub-total	120	79	15	
7) Client Relationship Management				
(1) Product and brand's reputation	10	9	1	10
(2) Efficient use of customer information and statistical analysis	10	7	2	9
(3) Process handling customer's complaints	10	7	1	8
(4) Rapid response to customer's complains	10	8	1	9
(5) Regular visits major customers	10	8	2	10

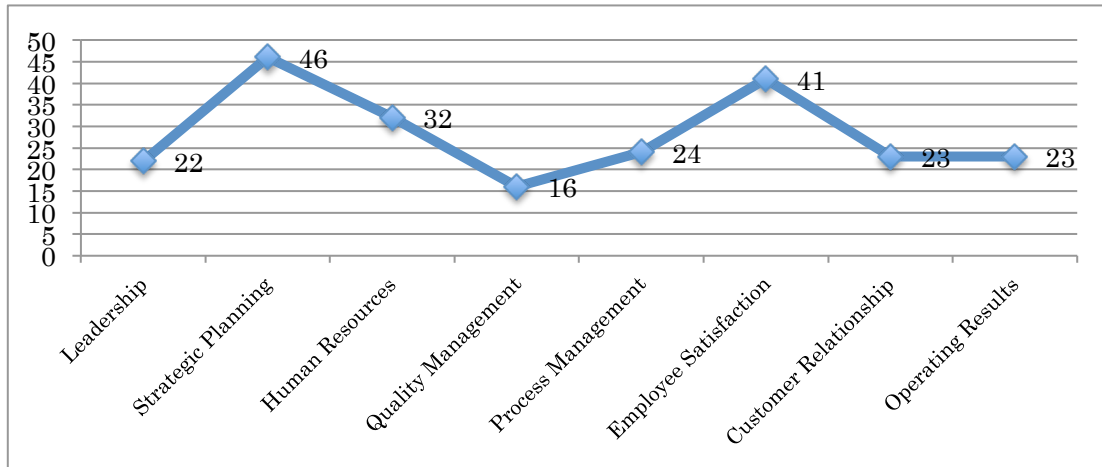
(6) Employees understand customer's needs and expectations	10	9	1	8
(7) Employees understand the key factors contribute to customer's satisfaction	10	9	1	8
(8) Company's effort to measure customer satisfaction and dissatisfaction	10	5	3	8
(9) Company regularly collects customer satisfaction and dissatisfaction and compares the results with those of peer companies	10	5	3	8
Sub-total	90	67	15	
8) Operating Results				
(1) Previous year's profit	10	8	1	9
(2) Market share of main products	10	8	2	10
(3) Profitability	10	8	2	10
(4) Previous year's revenue growth rate	10	8	1	9
(5) Comparison of output of each employee with peer companies	10	5	4	9
(6) Current products' ability to penetrate into new markets	10	8	0	8
(7) Performance of improving the productivity	10	8	1	9
(8) Performance of improving the operating costs	10	6	3	9
(9) Shareholders' satisfaction with profitability	10	8	0	8
Sub-total	90	67	14	

Figure 5.4.2: Livion’s Total Scores in the Eight dimensions



The gap between the subtotal and current performance from each of the eight dimensions is calculated and drawn (Figure 5.4.3 Livion’s Gap between Performance and Subtotal in each of the Eight Dimensions). The bigger the gap, the larger the space for improvement; on the other hand, the smaller the gap, the more ideal the current performance is. Overall, Livion performed best on the “Quality Management” with a gap of 10 points; second is “Leadership” with a gap of 15 points. Furthermore, the worst three performances that require improvements the most were: 1) Strategic Planning; 2) Employee Satisfaction; 3) Human Resources, with gaps of 46, 41, and 32 points respectively.

Figure 5.4.3 Livion’s Opinion Gap between the CEO & Senior Managers



Moreover, the sub-items in the first dimension, “Leadership”: “CEO's ability to review the organization's performance” received a significance of 10, but a 6 for the current performance. “CEO's ability to prioritize tasks to improve the organization's performance” received a significance of 9, but a 7 for current performance. This implied that the current performance evaluation system is not ideal, and hence decreases the CEO’s ability to review the organization’s performance

For the sub-items in the second dimension, “Strategic Planning”: Both “Company highly values strategic planning” and “Company regularly collects and analyzes internal and external information” received a significance of 10, but a 7 for current performance. “Company has short and long term strategic plans” received a significance of 9, but a 5 for current performance. “Company regularly reviews the targets for improvement” received a significance of 8, but a 7 for current performance. “Company understands your need for human resource” received a significance of 9, but a 7 for current performance. “Company utilizes its software and hardware efficiently” received a significance of 8, but a 5 for current performance. This indicates that Livion needs a strategic management system that helps to react quickly to the changes in the business environment and better utilize regularly collected internal and external information.

For the sub-items in the third dimension, “Human Resources”: “Employee's efficiency” received a significance of 9, but a 7 for current performance. “Employee's skills” received a significance of 8, but a 7 for current performance. “Congruency of performance evaluation system

and company's targets" received a significance of 9, but a 4 for current performance. "Employee's willingness to learn new skills and tasks" received a significance of 8, but a 7 for current performance. This indicates that the current performance evaluation system is not ideal and fails to align the organization and individual's efforts toward the same goals.

For the sub-items in the fourth dimension, "Quality Management": "Implementation of the quality control system" received a significance of 9, but a 7 for current performance. "Continuous improvement on product quality and services" received a significance of 8, but a 7 for current performance. "Ability to reduce costs of internal and external quality failure" received a significance of 8, but a 5 for current performance. This indicates that Livion lacks an internal operating cost reduction program that requires employees to use the recourses efficiently. However, this dimension performed relatively better than the first three dimensions.

For the sub-items in the fifth dimension, "Process Management": "Results of continuous improvement on quality, service and price" received a significance of 9, but a 5 for current performance. "Inventory turnover rate of products" received a significance of 8, but a 7 for current performance. "Cost of poor products compared to that of peer companies" received a significance of 8, but received a 7 for current performance.

For the sub-items in the sixth dimension, "Employee Satisfaction": "Quick response to employee's problem", "Company values the importance of working environment", and "Company provides employees with fair opportunity for development" received a significance of 8; however, both "Quick response to employee's problem" and "Company provides employees with fair opportunity for development" received a 7 for current performance. "Company values the importance of working environment" received a 5 for current performance. This indicates that Livion needs to improve the relationship with the employees by building a communication platform, understanding the problems employees encounter in the working place and provide proper solutions.

For the sub-items in the seventh dimension, "Customer Relationship Management": "Efficient use of customer information and statistical analysis" received a significance of 9, but a 7 for current performance. "Process handling customer's complaints" received a significance of 8, but

a 7 for current performance. Both “Company's effort to measure customer satisfaction and dissatisfaction” and “Company regularly collects customer satisfaction and dissatisfaction and compares the results with those of peer companies” received a significance of 8, but a 5 for current performance. This indicates that Livion lacks a customer satisfaction evaluation system that tracks feedbacks from the customers. Also, Livion needs to keep a record of satisfaction and dissatisfaction from both good loyal customers and bad customers who often delay payments for delivered products.

For the sub-items in the eighth dimension, “Operating Results”: “Comparison of output of each employee with peer companies” received a 9 for significance, but a 5 for current performance. “Performance of improving the operating costs” received a 9 for significance, but a 6 for current performance.

Figure 5.4.4: Significance of Livion Scored 8 and above

1) Leadership	Current Performance	Significance to the company
(2) CEO sets direction of the organization and pursuits future opportunities	8	9
(3) CEO's ability to review the organization's performance	5	9
(4) CEO's ability to prioritize tasks to improve the organization's performance	5	9
(5) CEO's ability to communicate with employees about his vision and strategy	4	8
2) Strategic Planning		
(1) Company has short and long term strategic plans	5	9
(2) Company sets an annual target and key measures	4	8
(3) Company Regularly reviews the targets for improvement	7	8
(4) Company understands the competitive environment of the market and ability to compete	5	9
(5) Company understands your need for human resource	7	9
(9) Company highly values strategic planning	7	10
(10) Company regularly collects and analyzes internal and external information	5	9
(12) Company utilizes its software and hardware efficiently	5	8
3) Human Resources		

(1) Employee's efficiency	7	9
(2) Employee's skills	7	8
(3) Smooth internal communication channels	8	9
(4) Employee's satisfactory with the company	8	8
(7) Employee's retention rate	8	8
(8) Congruency of performance evaluation system and company's targets	4	9
(10) Employee's willingness to learn new skills and tasks	7	8
4) Quality Control		
(1) Effective quality control & able to maintain customer satisfaction	5	9
(2) Continuous improvement on product quality and services	7	8
(3) Implementation of the quality control system	7	9
(4) Ability to reduce costs of internal and external quality failure	5	8
Sub-total	24	
5) Process Management		
(1) Degree of standardization of operating procedures	5	8
(3) Production efficiency compared to that of peer companies	9	9
(4) Results of continuous improvement on quality, service and price	5	9
(5) Inventory turnover rate of raw materials	9	8
(6) Inventory turnover rate of products	7	8
(7) Company's internal & external problem solving ability	9	8
(9) Cost of poor products compared to that of peer companies	7	8
(10) Production cost compared to that of peer companies	9	9
6) Employee Satisfaction		
(1) Quick response to employee's problem	4	8
(2) Establishment of good internal communication channels	5	9
(3) Establishment of good appraisal system to motivate employees	9	9
(5) Company values the importance of working environment	5	8
(6) Company provides employees with fair opportunity for development	7	8
(8) Company values employee's salary, benefit and job security	8	9
(9) Company values maintenance of employee's relationship	9	9
(11) Company's goal-setting and evaluation methods	8	8

7) Client Relationship Management		
(1) Product and brand's reputation	9	10
(2) Efficient use of customer information and statistical analysis	7	9
(3) Process handling customer's complaints	7	8
(4) Rapid response to customer's complains	8	9
(5) Regular visits major customers	8	10
(6) Employees understand customer's needs and expectations	9	8
(7) Employees understand the key factors contribute to customer's satisfaction	9	8
(8) Company's effort to measure customer satisfaction and dissatisfaction	5	8
(9) Company regularly collects customer satisfaction and dissatisfaction and compares the results with those of peer companies	5	8
8) Operating Results		
(1) Previous year's profit	8	9
(2) Market share of main products	8	10
(3) Profitability	8	10
(4) Previous year's revenue growth rate	8	9
(5) Comparison of output of each employee with peer companies	5	9
(6) Current products' ability to penetrate into new markets	8	8
(7) Performance of improving the productivity	8	9
(8) Performance of improving the operating costs	6	9
(9) Shareholders' satisfaction with profitability	8	8
Sub-total	69	

In Figure 5.2.4, the sub-items that Livion scored 5 points and below in the current performance are listed below:

Figure 5.4.5: Current Performance of Livion Scored 5 or Below

	Current Performance	Significance to the company
1) Leadership		
(3) CEO's ability to review the organization's performance	5	9
(4) CEO's ability to prioritize tasks to improve the organization's performance	5	9
(5) CEO's ability to communicate with employees about his vision and strategy	4	8
2) Strategic Planning		
(1) Company has short and long term strategic plans	5	9

(2) Company sets an annual target and key measures	4	8
(4) Company understands the competitive environment of the market and ability to compete	5	9
(10) Company regularly collects and analyzes internal and external information	5	9
(12) Company utilizes its software and hardware efficiently	5	8
3) Human Resources		
(6) Employee's ability to adopt to a variety of positions	5	5
(8) Congruency of performance evaluation system and company's targets	4	9
(9) Budget for education and training for employees	3	5
4) Quality Control		
(1) Effective quality control & able to maintain customer satisfaction	5	9
(4) Ability to reduce costs of internal and external quality failure	5	8
5) Process Management		
(1) Degree of standardization of operating procedures	5	8
(4) Results of continuous improvement on quality, service and price	5	9
6) Employee Satisfaction		
(1) Quick response to employee's problem	4	8
(2) Establishment of good internal communication channels	5	9
(4) Company provides training opportunities for employees	3	6
(5) Company values the importance of working environment	5	8
(10) Company values employee's career planning and growth	5	6
(12) Establishment of employee competency-training system	3	7
7) Customer Relationship Management		
(8) Company's effort to measure customer satisfaction and dissatisfaction	5	8
(9) Company regularly collects customer satisfaction and dissatisfaction and compares the results with those of peer companies	5	8
8) Operating Results		
(5) Comparison of output of each employee with peer companies	5	9

To summarize Livion's performance in Figure 5.4.5, a diagnosis on the organization's current business operation is provided in the following: For Leadership, due to the lack of a comprehensive and effective performance evaluation system, the leader did not have an adequate ability to review the organization's performance periodically, which led to inability to prioritize tasks in order to improve the organization's performance; For Strategic Planning, the link between the metrics of current performance evaluation system and the targets of the organization is inadequate. In other words, the employee's performance evaluation system did not combine well with the organization's objectives to provide a communication platform for the top management and employees, resulting in the dissatisfactory in the strategic planning; For both Human Resources and Employee Satisfaction, the lack of career planning leads to less enthusiasm to learn and perform at a high level.

From the results of the diagnosis, it also reflected that Livion's inability to understand the competitive market environment, including the lack of analyzing and comparing information collected, and the lack of objective indicators to measure customer satisfaction and dissatisfaction. Livion has not established a customer satisfaction and dissatisfaction system to compare the competitiveness and the output value of its employees and those of employees in the peers in the same industry, in order to reflect the flaws and improve its external competitiveness.

CHAPTER6. CONCLUSIONS

Section 1. DISCUSSION

Based on the findings, the NFM recycling industry will face increasingly strict operating conditions due to heavily polluted environment in China. Given worsening quality of air and water throughout China, the NFM recycling factories with unqualified facilities that produce both waste water and air failing to meet the environmental protection standards, set by Ministry of Environmental Protection, will be phased out of the business. Also noteworthy is that, both secondary copper and aluminum recycling factories need to upgrade their facilities and increase their annual production capacity of at least 50,000 tons before the end of 2015.

Given huge population and land area, China consumes more metals than it produces for various purposes, and is still in the middle of the industrialization. The excessive demands for basic metals (i.e. copper, aluminum, and zinc) have to be filled by secondary metal scraps from oversea markets. Thus, Chinese NFM market is still far from saturated, and has a huge potential for growth.

Overall, the strong points of Chinese nonferrous metal recycling industry can be summarized as follow:

1. Chinese government encourages metal recycling industry by the concept of circular economy and the facts that metal recycling provides energy savings & reduction of carbon emission. In 2010, it achieved savings of the energy & carbon emission by 14.1%, exceeded the target 10% benchmark set by the Energy Conservation Program of Nonferrous Metal Industry in 2007.
2. China is still in the middle of industrialization that requires huge amount of natural resources like nonferrous metals; nonferrous metal recycling play a critical role to supply such strong demand in China.
3. Good future prospect for nonferrous metal recycling industry because of the untapped Chinese waste automobile recycling market; nonferrous metal recycling business owners with economy of scale and strong financial positions have chances to backward-integrate

to waste automobile industry.

On the other hand, the weak points of Chinese nonferrous metal recycling industry can be summarized as follow:

1. Increasingly stringent environmental regulations and operating condition, in particular entry barriers to the nonferrous metal recycling industry.
2. Excessive production capacity of nonferrous metals and growing consciousness for environmental protection yield the need to eliminate small size nonferrous recycling and smelting factories that do not have sufficient environmental-friendly facilities with annual production of less than 30,000 tons.
3. Demand for secondary resources like nonferrous metals from developing countries aggravate global competition for such resources as well as the world metal prices listed on London Metal Exchange (LME) and Shanghai Futures Exchange (SHFE).

In this study, the implementation of Balanced Scorecard is suggested, aiming to provide Livion a comprehensive solution with a few merits for the current management system. This Balanced Scorecard was derived from two in-depth surveys regarding Livion's business philosophy and current business operating condition, in order to develop an accurate strategy map and an integrated set of measurements that can assist Livion to achieve short, median, and long term targets. To construct a Balanced Scorecard, Kaplan and Norton suggest the following initial impetus: 1) Clarify and gain consensus about vision and strategy; 2) Build a management team; 3) Communicate the strategy; 4) Link reward to achieving strategic objectives; 5) Set strategic targets; 6) Align resources and strategic initiatives; 7) Sustain investment in intellectual and intangible assets; 8) provide a foundation for strategic learning. In the case of Livion, the implementation of Balanced Scorecard is suggested with the following four steps: (Kaplan and Norton, 1996)

1. Clarifying and translating the vision and strategy:

According to the Balanced Scorecard's four core perspectives, "Financial", "Customer",

“Internal–Business-Process”, and “Learning and Growth”, the top management and/ the leader of the organization turn the organizational strategy into practical and measurable organizational goals; They should first consider the profitability, cash flow, revenue, and market growth in the financial perspective. Then, define the target market in the customer perspective, identify the targets in the internal-business-process perspective, and integrate with the targets in the learning and growth perspective. Through the strategic targets based on the organizational strategies, they could clarify and illustrate the business philosophy and strategy, in order to form consensus in the organization.

2. Communicating and linking:

Through discussion and training, the employees can better understand their individual goals. To consolidate the goals of the organization and the individuals, Livion need to promote short, medium, and long term goals among the departments, in order to link performance bonuses with corresponding measurements.

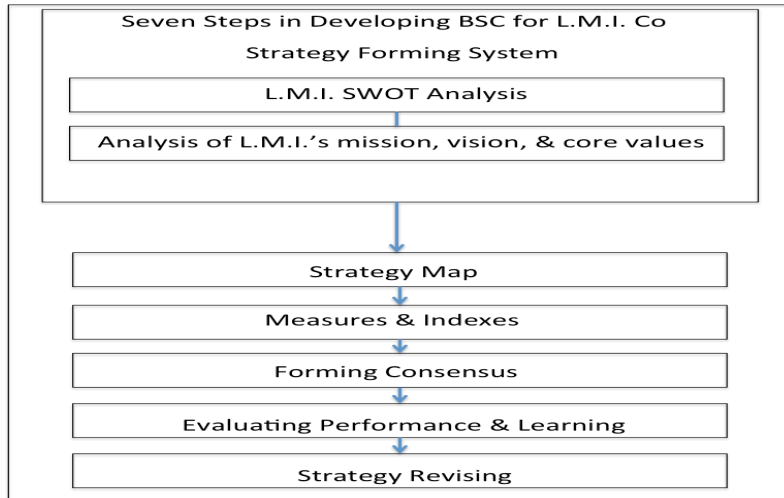
3. Planning and target setting:

With a base level of understanding, executive teams from each department should translate the strategic objectives into personal and team objectives. Kaplan and Norton suggests the leader and/ the top management team to set a three to five year plan for financial measurements, linking the other three perspectives of customer, internal-business-process, and learning and growth.

4. Strategic feedback and learning:

Inserting Balanced Scorecard into the strategic learning framework will improve the internal strategic learning in a way that allows each participant to see how his or her work contribute to performance of the overall strategy. Also, this shared strategic framework can be used to communicate and examine the strategy, and collect feedbacks in order to revise the strategy.

Figure 6.1.1: Steps in Developing Balanced Scorecard for Livion



Section 2. MEASURES AND INDEXES

If we consider strategy map as the core of BSC, the performance measures and indicators not only imply key performance measures, but also regard as strategic measures. Based on the strategic theme of quality, service, and professionalism, a list of appropriate performance evaluation indicators is established, including items, process performance indicators, item description, organizing department, and assessment period cycles:

Figure 6.2.1: Reference Performance Indicator List

Items	Process Performance Indicators	Description (i.e. method, form, and record)	Calculation	Organizing Dept.	Assessment Period Cycles
1	Product life-cycle cost	New design or Mass-produce		Sales & Marketing	Quarterly
2	Quality management system	Self evaluation according to ISO-9001/QS9000/ISO-14001		General Manager	Annual
3	Corporate performance evaluation	Cost control, income statement		Finance	Monthly
4	Avg. employee salary	(Annual personnel cost) / (Total # of employees) / (12 mths)		Finance	Annual
5	Avg. employee profitability	Seasonal profit / (Total # of employees)		Finance	Quarterly
6	Staff absence rate	(Total # days of actual attendance) / (# of employees x required days of attendance)		Sales & Marketing	Monthly
7	Accident rate	(# of injuries and illnesses x		Operation	Monthly

1,000,000) / (Total working hours of all employees)				
8	Training program achieve rate	(Actual training lesson hours) / (Planned training lesson hours)	Sales & Marketing	Monthly
9	Training cost	Training fee / Training budget	Sales & Marketing	Monthly
10	Fine/Penalty received	Factory safety and hygiene, water and air standards, fire hydrant	Finance	Monthly
11	Net revenue achieve rate	(Actual net revenue) / (Expected net revenue)	Finance	Monthly
12	Sales target achieve rate	(Actual sales – products refunded) / (Expected sales)	Sales & Marketing	Monthly
13	On-time product delivery	(Delayed delivery) / (Total delivery)	Operation	Monthly
14	New product type	# of new type of products, their contribution	Operation	Quarterly
15	On-time supply delivery	(Delayed supply delivery) / (Total supply delivery)	Operation	Monthly
16	Material consumption rate	(Actual material consumption cost) / (Expected material consumption cost) x 100%	Operation	Monthly
17	Material turn-over rate	Product sales/Material inventory	Operation	Monthly
18	Production achieve rate	(Actual qualified products)/(Planned production) x 100%	Operation	Monthly
19	Unplanned downtime rate	(Unplanned downtime hours)/(total planned production hours)	Operation	Monthly
20	Defect rate	Product quality management daily report	Operation	Monthly
21	Key facility failure	Facility repair application forms	Operation	Monthly
22	Public utility downtime rate	Power and water supply failure	Finance	Monthly
23	Machinery repair	Machinery maintenance & repair application forms	Operation	Monthly
24	Total device efficiency	(Machine running time) x (performance rate) x (quality product produced)	Operation	Monthly
25	Inventory turnover rate	Net sales / Inventory	Sales & Marketing	Monthly
26	Delivery fee rate	Total delivery fee – (Sales x Avg. delivery fee per ton of product)	Finance	Monthly
27	Account receivable turnover	(Net credit sales) / (Avg. account receivable)	Finance	Monthly
28	# days of Account receivable	Avg. days of account receivables	Finance	Monthly
29	Customer	Statistics of customer complains	Sales &	Monthly

	complaints		Marketing	
30	Customer satisfaction	Customer satisfaction survey (quality, reliability, delivery, price, service, innovation, complains, co-operation, staff capability, technique)	Sales & Marketing	Semi-annual
31	Customer loyalty	Repeat rate, loss rate, new customer acquiring rate	Sales & Marketing	Semi-annual
32	Customer contribution	Ranking of amount contributed by customers	Sales & Marketing	Semi-annual
33	Official website server reliability	Internet service downtime hours	Sales & Marketing	Monthly
34	Power consumption rate	Actual quarterly power consumption (factory, office, and machinery)	Finance	Monthly
35	Water consumption rate	Water usage record	Finance	Monthly
36	Unexpected incidents in the factory	Small to big issues, and/or losses and costs reflected on the balance sheet	Operation	Semi-annual
37	Investment amount on environmental protection	Facility upgrade, government official relationship building & maintenance	Finance	Quarterly
38	Quality product delivery rate	Refund, defect rate	Sales & Marketing	Semi-annual
39	Outstanding supplier	Order description in accordance with actual content, amount of WEEE	Sales & Marketing	Quarterly
40	Cost comparison	Internal cost control	Finance	Quarterly
41	Operating result: Profitability	Capital, equity profitability	Finance	Quarterly
42	Operating result: Growth	Profit, sales growth	Finance	Quarterly
43	Operating result: Stability	Employee turnover rate	Finance	Quarterly
44	Operating result: Productivity	Avg. value added per employee; capital productivity; Labor rate = (Employee cost) / (Value added)	Finance	Quarterly
45	Operating result: Liquidity	Total asset turnover; fixed asset turnover; inventory turnover	Finance	Quarterly

According the famous discussion of the Balanced Scorecard Success Case Study: Smart companies only track the most important performance measures “retain 20% of the measures that can provide 80% of the useful information” (Kaplan & Norton, 2004). Therefore, this study chose three to six metrics for each of the eight dimensions, and as each measure gains progress, more measures would be added into the Balanced Scorecard. In establishing the performance measures

and indicators, Kaplan and Norton suggest the following measures in the financial, customer and learning and growth perspectives:

Core Financial Measures:

- Return-on-investment/economic value-added
- Profitability
- Revenue growth/mix
- Cost reduction productivity

Core Customer Measures:

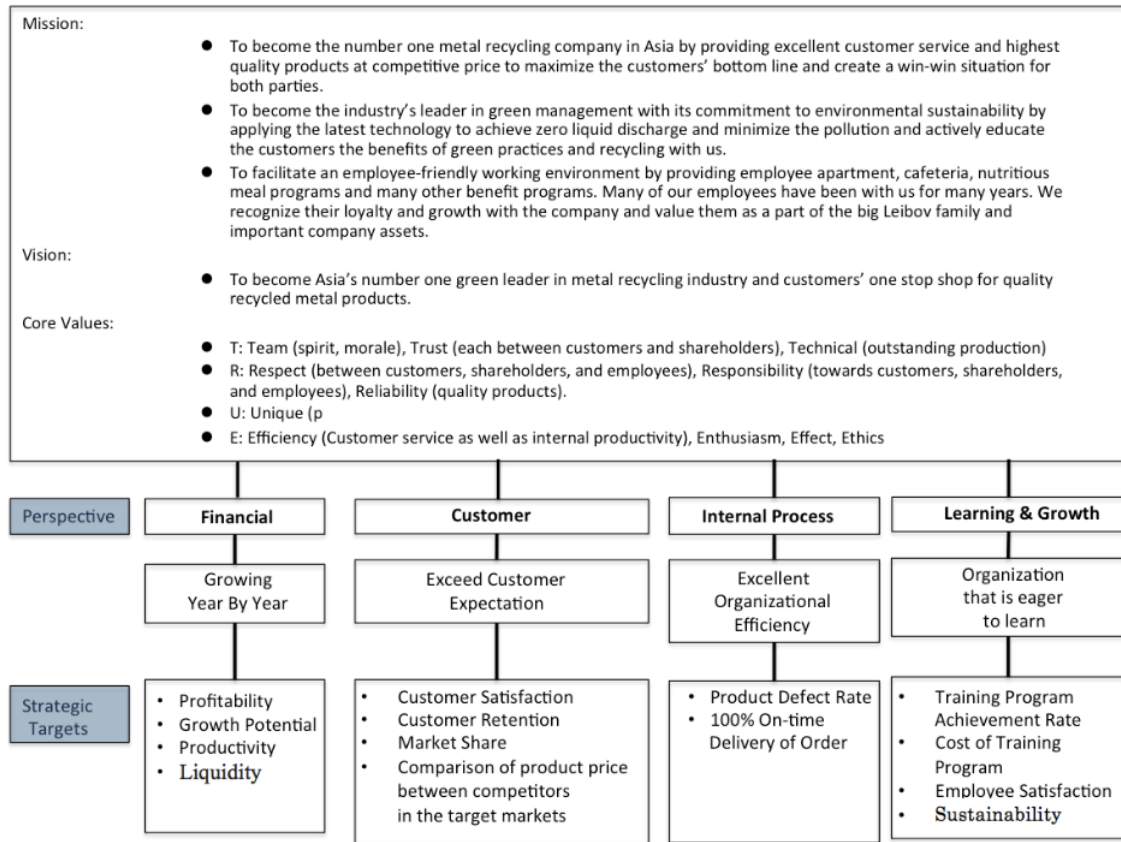
- Market share
- Customer acquisition
- Customer retention
- Customer profitability
- Customer satisfaction

Core Learning and Growth Measures

- Employee satisfaction
- Employee retention
- Employee productivity

The strategy map is a visual indicator of organizational health and tells how well a company is meeting its goals. It also illustrates cause and effect linkages, (Walker, 2001). The following are the key performance measures in each of the four perspectives constructed according to Livion's strategy map:

Figure 6.2.2: Strategy Map of Livion



Section 3. CONSENSUS FORMING

Having constructed the strategy map and performance measures and indicators, the organization should utilize all the possible internal communication channels to motivate all the managers and employees to implement Balanced Scorecard successfully. During the departmental meetings, the organization should not only announce the performance indicators that linked with incentives to the department heads, but also the put up posters regarding such information, in order to create a highly motivated grassroots in the organization.

According the reference data, surveys and interactions with the management team, the employees of the Livion sense enormous pressure to improve and sustain revenue growth. Based on Kotter's (1996) eight step change model described in Table 6.3.1, "70% of all change initiatives fail, only 10% succeeded; establishing a sense of urgency is the key success factor in these 10%

successful cases”. In the process of an organizational change, establishing a sense of urgency would encounter two potential obstacles (Kotter, 1996):

1. False sense of urgency:

Letting members in the organization feel very busy that there are endless meetings to attend and reports to finish, while all the activities are passive-driven; such negative work atmosphere would lead to a lot of negative emotions and fatigue, decreasing the productivity as a result.

2. Complacency:

An organization that indulges in the past success would not be able to sense the fluctuating demands in the market due to slow responsiveness and declining sensitivity to the market, ignoring new threats and opportunities.

Figure 6.3.1: Kotter’s Eight Step Change Model

STEP	CHECKLIST
Step 1: Establishing a Sense of Urgency	-Help others see the need for change and the importance of acting immediately -Identify and discuss crises, potential crises or major opportunities
Step 2: Creating the Guiding Coalition	-Make sure there is a powerful group guiding the change, one with leadership skills, bias for action, credibility, communication skills and authority and analytical skills -Assemble a group powerful enough to lead & influence the change -Show people what is needed through modeling behaviors -Getting the group to work together like a team -Act in a way that hits the emotions -When a “moment of truth” event occurs, grab it and turn it into a story to tell
Step 3: Developing a Vision and Strategy	-Clarify how the future will be different from the past, and how you will make the future a reality -Creating a vision to help direct the change effort -Getting the vision and strategy right -Developing strategies to achieve the vision
Step 4: Communicating the change	-Make sure as many others as possible understand and accept the vision and the strategy -Using every vehicle possible to constantly communicate the new vision and the strategy -Have the guiding coalition role model the behavior expected of staff
Step 5: Empowering Broad-Based Action	-Enable others to act on the vision by getting rid of obstacles, encourage risk taking -Altering systems or structures that undermine the change vision
Step 6: Generating	-Plan for and generate short term wins/improvements in performance -Creating those wins

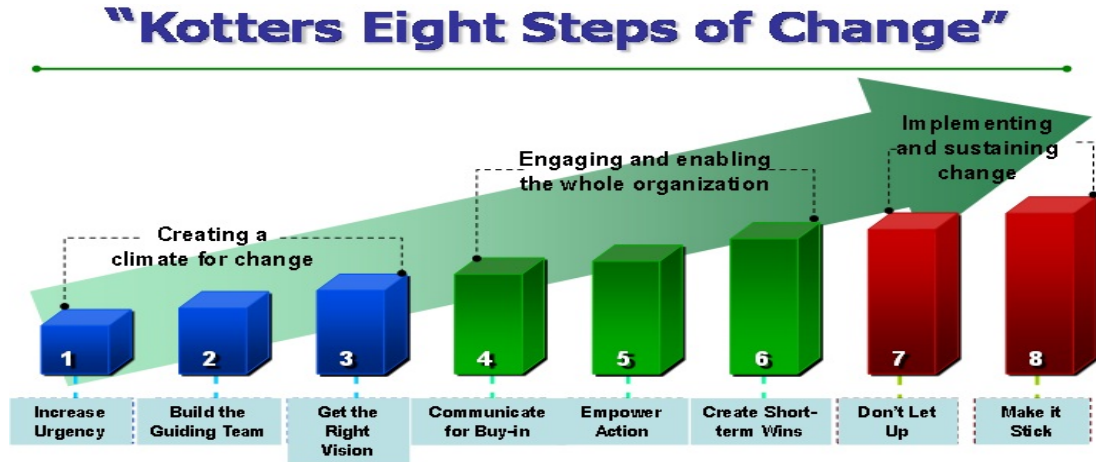
Short-Term Wins	-Recognize and reward those people who make wins possible
Step 7: Consolidating Gains and Producing More Change	-Press harder and faster after the first success -Not letting up, consolidating improvements and sustain the momentum for change -Use increasing credibility to change all systems, structures and policies that don't fit together and don't fit the transformation effort -Reinvigorate the process with new projects, themes and change agents
Step 8: Anchoring New Approaches in the Culture	-Hold on to the new ways of behaving, and make sure they succeed until they become a part of the very culture of the group -Articulate the connections between new behaviors and organizational success

Source: Kotter, J.P. & Cohan. D. (2002) The heart of change, real life stories of how people change their organizations. Boston: Harvard business school press.

With increasing sales revenue in recent years, Sales and marketing department of Livion indulges in the success with the current customer base, and is not motivated to explore new customers. Furthermore, Sales and marketing department regards themselves as the leading department, adjusting other departments' working schedules, making a false sense of urgency, and causing problems that led to declining employee satisfaction. However, Livion could exploit this opportunity to implement Balanced Scorecard into the organization, creating a sense of urgency, or even crisis, in order to motivate the employees to be more willing to accept the change in the organizational management system.

According to Kotter (1996), the real sense of urgency rarely exists without being artificially created. Three ways to create such sense of urgency are as follows: 1) keeping an eye on the progress of the promotion of Balanced Scorecard, the president and the management team should reflect on the sense of urgency in daily activities,; 2) Comparing the report of current operating condition with the previous performance evaluation results made by each department, the management team should encourage each department to turn crisis into opportunity to implement the Balanced Scorecard, if there is any poor performance discussed in the annual meeting; 3) integrating the internal reward system with the performance measures and indicators, the organization should be able to recognize the outstanding performers and punish the poor performers; 4) imposing appropriate pressure in the shortest time to reach a consensus of how to improve internal performance and external competitiveness.

Figure 6.3.2: Kotter's Eight Steps of Change



■ Kotter, John P. and Cohen, Dan S. *The Heart of Change*. Boston: Harvard Business School Press

Source: Kotter, J.P. & Cohan, D. (2002) *The heart of change, real life stories of how people change their organizations*. Boston: Harvard business school press. <http://blogs.ubc.ca/etec530leadingchange/learning-topics/kotters-model/>

Section 4. EXPECTATIONS OF THE IMPLEMENTATION OF BSC

We can summarize the major problems Livion currently faces are the result of the lack of a complete and well-designed performance evaluation system. The structure of the current performance evaluation system tends to be imprecise because it does not combine the organizational goals with its strategies, and thus does not reflect the organization's current operating condition, nor could it help solving the issues. More specifically, it lacks a list of standardized measures and indicators to be used as a diagnosis tool. If Livion implements Balanced Scorecard and executes the plan accordingly, it would generate the following merits:

1) Communication platform:

Using Balanced Scorecard as a communication tool aligns all employees within the organization as well as senior executives and shareholders to the strategy. The knowledge and alignment to better understand the direction of the organization, and to help customers better understand the competitive advantage of Livion's current strategy and future prospects. This would enhance individual's expertise and growth, and ultimately, eliminate the poor performance within the organization.

2) Guide:

Based on organizational strategy and vision, Balanced Scorecard would help to enhance core competitiveness and better integrate individual efforts with the direction of the organization. The implementation of Balanced Scorecard would act as a guide to assist the organization to reach a strategy, and better execute pre-assumed targets, in order to tackle the current organizational stagnation.

3) Problem Diagnosis:

Based on the findings of the two surveys, the CEO needs to strengthen the ability to better review and prioritize tasks in order to improve organization's overall performance. Balanced Scorecard can assist the CEO to reinforce such ability once it is implemented. With the suggested measures and indicators, Balanced Scorecard can assist the organization to better identify strategic objectives, and review the measures quarterly for further revising for improvement in the future.

4) Consistency:

Balanced Scorecard can function as a cross-departmental performance evaluation system to standardize and quantify measures and indicators from each department. It would integrate the efforts and targets of all departments by forming consensus and establishing a list of performance measurements.

5) Double communication loop:

Instead of letting department heads to design and control the performance evaluation system for their own department, Balanced Scorecard provides unified measurements and strategic objectives. To achieve two-way communication, department heads would review the Balanced Scorecard regularly and encourage feedbacks from members in their department.

6) Flexibility:

With periodic review and revision, BSC can help Livion to maintain high market responsiveness and sensitivity. In other words, Livion would be able to stay keen to employ cunning marketing tactics as business environment evolves.

7) Cause and Effect Relationship:

Cause-and-effect relationships can be interpreted as a set of hypotheses based on a strategy and a sequence of if-then statements. “Every measure selected for a Balanced Scorecard should be an element of a chain of cause-and-effect relationships that communicates the meaning of the business unit’s strategy to the organization” (Kaplan & Norton, 1996, pp. 149). For example, if Livion increases the staff training about products, then they will become more knowledgeable about the products, then their sales capability will be enhanced. If their sales capability improves, then the average margins of the products they sell will increase.

8) Equilibrium:

BSC can assist Livion to achieve short and long term, financial and non-financial, leading and lagging indicators, and internal efficiency and external competitiveness.

This study suggests that BSC can not only solve Livion’s ineffective performance evaluation system, but it can also acts as a functional and well-balanced management system that guides it to promised results. In other words, if BSC can be fully implemented, it would enable Livion to acquire more new customer base, develop a forward-looking performance evaluation system to enhance the organizational performance and core competitiveness, and ultimately, help to achieve both the medium term (5-year) goal of a net annual profit of 10% and long term (10-year) goal of upstream vertical integration into Chinese waste automobile recycling industry.

APPENDIX A

LIVION'S BUSINESS PHILOSOPHY QUESTIONNAIRE

使命陳述和核心價值觀-問卷調查

親愛的 L.M.I Co. 經營管理團隊長官,您好:

為了解貴公司的使命、價值觀和願景,以建立一套完善的績效評估制度,請長官就下列問題填寫個人想法和意見。

感謝您的參與和協助!

* Required

1. 職稱 *

.....

2. 部門

.....

3. 1.) 請問公司的主要產品/服務為何? *

.....

4. 2.) 請問公司的主要市場和客戶群? *

.....

5. 3.) 請問我們如何滿足客戶需求? *

.....

6. 4.) 請描述公司對外(客戶)和對內(員工)的經營哲學和組織文化。 *

.....

7. 5.) 請以顧客的角度思考,您希望公司未來五年的願景為何? *

提供顧客價值方面(請從顧客的觀點,描述我們可提供的價值)。

.....

8. 6.) 請以顧客的角度思考,您希望公司未來五年的願景為何? *

品牌競爭力(從客戶的觀點,描述我們在競爭的市場中所希望佔有的地位)。

.....

9. 7.) 請以員工個人發展的角度思考,您希望公司未來五年的願景為何? *
- 工作環境(請描述所期望的工作環境)。

10. 8.) 請以員工個人發展的角度思考,您希望公司未來五年的願景為何? *
- 激勵/領導方面(請描述在制度面和福利面的期望)。

11. 9.) 請以經營者角度思考,您希望公司未來五年的願景為何? *
- 事業發展(請描述所期望的事業擴展和成長情況)

12. 10.) 請以經營者角度思考,您希望公司未來五年的願景為何? *
- 財務營運(請描述所期待的財務表現。)

13. 11.) 您認為公司未來五年的外部競爭力(相較於競爭對手)關鍵成功因素為何? *

APPENDIX B

LIVION'S CURRENT CONDITION OF BUSINESS OPERATION

基本資料+問卷調查

親愛的L.M.I Co.重要幹部,您好:
本問卷旨在了解貴公司的基本情況,
就公司現況進行診斷,請就個人主觀意識作答。
謝謝您的參與和協助

* Required

1. 性別 *

Mark only one oval.

- 男
 女

2. 年齡 *

Mark only one oval.

- 26 歲~29 歲
 30 歲~35 歲
 36 歲~39 歲
 40 歲~45 歲
 46 歲以上

3. 教育程度 *

Mark only one oval.

- 國中
 高中
 大專(學)
 研究所以上
 其他

4. 服務年資 *

Mark only one oval.

- 少於 5 年
 5~10 年
 11~15 年
 15 年~20年
 20年以上

5. 服務部門 *

Mark only one oval.

- 經營管理團隊
- 財政部
- 生產部
- 業務部
- 人事部兼行政

6. (一) 領導力：問題1.)最高領導者建立授權、創新、鼓勵和員工學習的 組織 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. (一) 領導力：問題2.)最高領導者設定組織的方向和追求未來的機會 *

公司目前表現

Mark only one oval.

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8. (一) 領導力：問題3.)最高領導者定期審查組織的績效和能力 *

公司目前表現

Mark only one oval.

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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. (一) 領導力：問題4.)最高領導者由審查組織的績效,提出公司改善優先順序 *

公司目前表現

Mark only one oval.

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10. (一) 領導力：問題5.) 最高領導者對員工溝通並詮釋公司願景和策略 *

公司目前表現

Mark only one oval.

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11. (二) 策略規劃：問題1.) 公司已有規劃短、中、長期的策略計畫 *

公司目前表現

Mark only one oval.

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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. (二) 策略規劃：問題2.) 公司每年訂定年度目標,並設定立主要的衡量 指標 *

公司目前表現

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13. (二) 策略規劃：問題3.) 定期檢討年度目標持續改善 *

公司目前表現

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14. (二) 策略規劃：問題4.) 公司了解市場競爭的環境和能力 *

公司目前表現

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15. (二) 策略規劃：問題5.) 公司了解你的人力資源能力和需求 *

公司目前表現

Mark only one oval.

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16. (二) 策略規劃：問題6.) 公司了解客戶對產品/服務的需求和期望 *

公司目前表現

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17. (二) 策略規劃：問題7.) 公司了解供應商和伙伴的能力和需求 *

公司目前表現

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18. (二) 策略規劃：問題8.) 公司了解主要的人力資源需求和計劃 *

公司目前表現

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19. (二) 策略規劃：問題9.) 公司十分注重策略規劃 *

公司目前表現

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20. (二) 策略規劃：問題10.) 公司定期收集、分析、內外部資訊 *

公司目前表現

Mark only one oval.

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21. (二) 策略規劃：問題11.) 對於公司的目標不斷的向員工溝通 *

公司目前表現

Mark only one oval.

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22. (二) 策略規劃：問題12.) 公司的軟、硬體資源能有效的發揮 *

公司目前表現

Mark only one oval.

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23. (三) 人力資源：問題1.) 員工的工作效率 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. (三) 人力資源：問題2.) 員工的技能 *

公司目前表現

Mark only one oval.

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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. (三) 人力資源：問題3.) 公司內部溝通管道順暢 *

公司目前表現

Mark only one oval.

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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. (三) 人力資源：問題4.) 員工對公司的滿意度 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. (三) 人力資源：問題5.) 員工的薪資 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
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28. (三) 人力資源：問題6.) 員工適應各種職務的能力 *

公司目前表現

Mark only one oval.

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29. (三) 人力資源：問題7.) 員工的延續率 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

30. (三) 人力資源：問題8.) 員工的績效考核制度與目標結合 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. (三) 人力資源：問題9.) 員工的教育訓練預算 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. (三) 人力資源：問題10.) 員工樂於學習新的事務和技術 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

33. (四) 品質管理系統：問題1.) 品質管理系統有效運作,維持顧客滿意的能力 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

34. (四) 品質管理系統：問題2.) 對品質、產品、服務持續改善的能力 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35. (四) 品質管理系統：問題3.)公司已通過品質系統驗證並落實執行 *

公司目前表現

Mark only one oval.

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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

36. (四) 品質管理系統：問題4.)降低內、外部品質失敗成本的效果 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

37. (五)過程管理：問題1.) 作業流程標準化的程度 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

38. (五)過程管理：問題2.) 目前產品的品質水準與同業比較 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

39. (五)過程管理：問題3.) 生產的效率與同業比較 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. (五)過程管理：問題4.) 公司對品質、服務、價格持續不斷改善的效果 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

41. (五)過程管理：問題5.) 原物料庫存的週轉率 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

42. (五)過程管理：問題6.) 產品庫存的週轉率 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

43. (五)過程管理：問題7.) 當內、外部有不符合要求時,公司有解決問題的方法 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

44. (五)過程管理：問題8.) 公司空間使用的附加價值 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

45. (五)過程管理：問題9.) 產品不良的成本與同業比較 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

46. (五)過程管理：問題10.) 生產成本與同業比較 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

47. (六) 員工關係滿意：問題1.) 公司對於員工的問題快速回應 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

48. (六) 員工關係滿意：問題2.) 建立良好的內部溝通管道 *

公司目前表現

Mark only one oval.

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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

49. (六) 員工關係滿意：問題3.) 公司建立激勵員工辦法,表揚員工和團隊 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

50. (六) 員工關係滿意：問題4.) 公司提供員工教育訓練的機會 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

51. (六) 員工關係滿意：問題5.) 公司重視員工的工作環境 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

52. (六) 員工關係滿意：問題6.) 公司建立一個公平發展的機會 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

53. (六) 員工關係滿意：問題7.) 公司重視員工健康和工作安全 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

54. (六) 員工關係滿意：問題8.) 公司重視員工的薪資、福利和工作保障 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

55. (六) 員工關係滿意：問題9.) 公司重視員工關係的維持 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

56. (六) 員工關係滿意：問題10.) 推動員工的生涯規劃,引導員工成長 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

57. (六) 員工關係滿意：問題11.) 公司建立目標設定和評價方法 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

58. (六) 員工關係滿意：問題12.) 公司建立員工能力要求和訓練需求制度 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

59. (七) 顧客滿意與客戶關係管理：問題1.) 公司產品品牌在市場的口碑 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

60. (七) 顧客滿意與客戶關係管理：問題2.) 公司對於顧客資料進行蒐集、統計分析, 充分利用 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

61. (七) 顧客滿意與客戶關係管理：問題3.) 對於客戶抱怨處理有建立處理流程 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

62. (七) 顧客滿意與客戶關係管理：問題4.) 當客戶有抱怨時都能快速反應 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

63. (七) 顧客滿意與客戶關係管理：問題5.) 公司定期拜訪公司主要的客戶 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

64. (七) 顧客滿意與客戶關係管理：問題6.) 員工了解客戶的需求和期望 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

65. (七) 顧客滿意與客戶關係管理：問題7.) 員工了解使顧客滿意的主要接觸點 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

66. (七) 顧客滿意與客戶關係管理：問題8.) 公司有建立衡量客戶滿意和不滿意的方法 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

67. (七) 顧客滿意與客戶關係管理：問題9.) 公司定期收集並比較客戶對本公司與競爭者間之滿意或不滿意資訊 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

68. (八) 營運成果：問題1.) 去年公司的利潤 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

69. (八) 營運成果：問題2.) 目前公司主要產品市場占有率 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

70. (八) 營運成果：問題3.) 目前公司的獲利能力 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

71. (八) 營運成果：問題4.) 去年營業額的成長率方面 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

72. (八) 營運成果：問題5.) 每個員工產值與同業比較 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

73. (八) 營運成果：問題6.) 產品對於進入新市場能力 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

74. (八) 營運成果：問題7.) 生產力提升的績效 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

75. (八) 營運成果：問題8.) 營運成本改善的績效 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

76. (八) 營運成果：問題9.) 股東對公司的獲利能力滿意程度 *

公司目前表現

Mark only one oval.

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

REFERENCES

- [1] Baiman, S., & Noel, J. (1982, Spring). Noncontrollable Costs and Responsibility Accounting. *Journal of Accounting Research*, pp.184-220.
- [2] Birch, C. (1998). Balanced Scorecard Points to Wins for Small Firms. *Australian CPA*, 68 (6), pp. 43-45.
- [3] Bird, A., & Beechler, S. (1995). Links between Business Strategy and Human Resource Management Strategy in U.S.-Based Japanese Subsidiaries: An Empirical Investigation. *Journal of International Business Studies* , 26 (1), pp. 23-46.
- [4] Bushman, R. M., Indjejikian, R. J., & Smith, A. (1996, April 21). CEO Compensation:The Role of Individual Performance Evaluation. *Journal Of Accounting And Economics*, pp. 161-193.
- [5] Bushman, R., Indjejikian, R., & Smith, A. (1996, April 21). CEO Compensation:The Role of Individual Performance Evaluation. *Journal Of Accounting And Economics*, pp. 161-193.
- [6] China Certification & Inspection Group. <http://www.ccic.com/web/homepage.html>
- [7] China Nonferrous Metals Industry Association. (2012). *The Yearbook of Nonferrous Metals Industry of China*. China Nonferrous Metals Industry Yearbook Editorial Board.
- [8] The National Development and Reform Commission The People's Republic of China, (2012). *China's Policies and Actions for Addressing Climate Change*, pp. 2
- [9] Chow, C., Haddad, W., & Williamson, J. E. (1997, Aug.). Applying the Balanced Scorecard to Small Companies. *Management Accounting*, pp. 21-27.
- [10] Dyer, L., & Reeves, T. (1995). Human Resource Strategies and Firm Performance: What Do We Know and Where Do We Need to Go? *International Journal of Human Resource Management*.
- [11] Eccles, R. G., & Pyburn, P. J. (1992, October). Creating A Comprehensive System to Measure Performance. *Management Accounting*, 74 (4), pp. 41-44.
- [12] ECORYS. (2011). *Competitiveness of the EU Non-ferrous Metals Industries*.
- [13] European Chamber. (2011). *Non-Ferrous Metals Working Group*.
- [14] Fontana, A., & Frey, J. H. (1998). Interviewing: The art of science. In N. K. Denzin & Y. S. Lincoln (Eds.), *Collecting and Interpreting Qualitative Materials* (pp. 47-78): Thousand Oaks, CA:Sage.
- [15] Fontana, A., & Frey, J. H. (2000). The interview: from structured questions to negotiated text. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 645-672): Thousand Oaks, CA:Sage.
- [16] Hammer, M., & Champy, J. (1994). *Reengineering the Corporation: A Manifesto for Business Revolution*. New York: Harper Business.
- [17] Hoffeecker, J., & Goldenberg, C. (1994, Fall). Using The Balanced Scorecard to Develop Company - Wide Performance Measures. *Cost Management*, 8 (3), pp. 5-17.
- [18] International Energy Agency. (2011-12). *Key World Energy Statistics*.
- [19] ISRI. (2012). *The ISRI Scrap Yearbook*.
- [20] KaplanS.Robert, NortonP.David. (1992). *The Balanced Scorecard: Measures that Drive Performance*. Harvard Business Review Press, pp. 71-80
- [21] KaplanS.Robert, NortonP.David. (1996). *The Balanced Scorecard: Translating strategy into action*. Harvard Business Review Press.
- [22] KaplanS.Robert, (2010). *Conceptual Foundations of the Balanced Scorecard*, pp. 3
- [23] Kotter, J.P. & Cohan. D. (2002) *The heart of change, real life stories of how people change their organizations*. Boston: Harvard business school press. <http://blogs.ubc.ca/etec530leadingchange/learning-topics/kotters-model/>
- [24] Lawrence Berkeley National Laboratory. (2007). *China Energy Databook: User Guide and Documentation, Version 7.0*.

- [25] Lee, C. (1985). Increasing Performance Appraisal Effectiveness Matching Task Types, Appraisal Process, and Rater Training, *Academy of Management Review*. 10 (2), pp. 322-331.
- [26] Lee, C. (1985). Increasing Performance Appraisal Effectiveness Matching Task Types, Appraisal Process, And Rater Training, *Academy Of Management Review*. 10 (2), pp. 322-331.
- [27] Ling Tong Metal Information Co. Ltd. <http://www.lingtonginfo.com/en2010/en/eindex.asp>
- [28] LyonsDonald. (2010). Circuits of Scrap: closed loop industrial ecosystems and the geography of U.S. international recyclable material flows, 1995-2005. . University of North Texas, Department of Geography.
- [29] Hammer, M. and Champy, J. (1994), *Reengineering the Corporation. A Manifesto for Business Revolution*, HarperCollins, New York, NY.
- [30] Ministry of Environmental Protection of the People's Republic of China. (2004-11). Report on the State of the Environment in China.
- [31] Ministry of Environmental Protection The People's Republic of China. Environmental quality standard for surface water. http://english.mep.gov.cn/standards_reports/standards/water_environment/quality_standard/200710/t20071024_111792.htm
- [32] Myers, M. D., & Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and Organization*, 17(1), 2-26.
- [33] Nathan Associates Inc. (2004). *The National Inventory of Obsolete Copper Scrap Accumulation and Availability, 1982-2003*.
- [34] Nkomo, S. M. (1987, Jul. - Aug.). Human Resource Planning and Organization Performance: An Exploratory Analysis. *Strategic Management Journal* , 8 (4).
- [35] OECD. (2007). *Environmental Performance Reviews: China*.
- [36] Reuter M.A., Heiskanen K., Boin U., van Schaik A., Verhoef E., Yang Y., (2005). *The Metrics of Material And Metal Ecology: Harmonizing The Resource, Technology And Environmental Cycles*. (Wills B.A.) Elsevier.
- [37] Smith Deonta. (2013). *Nonferrous Metal Recycling in the US* . IBISWorld.
- [38] The National Development and Reform Commission The People's Republic of China. (2012). *China's Policies and Actions for Addressing Climate Change*.
- [39] UNEP (2011) *Recycling Rates of Metals – A Status Report*, A Report of the Working Group on the Global Metal Flows to the International Resource Panel. Graedel, T.E. et al., (pp.40)
- [40] van Beukering J.H. Pieter, van den Bergh C.J.M. Jeroen. (2005). *Modelling and analysis of international recycling between developed and developing countries*. Elsevier.
- [41] 于泳泓, & 陳依蘋. (2004). *平衡計分卡完全教戰手冊*. 梅霖文化.